

The Iron Age

A Review of the Hardware and Metal Trades.

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Fifteen-Ton Steam Hammer at the Vienna Exhibition.

The great development which has taken place during the last ten years in the manufacture of large forgings of both iron and steel, has given rise to the construction of large and powerful steam hammers, which should enable such heavy masses to be successfully worked. Steam hammers of 10 to 15 tons weight, with a correspondingly large stroke, have, therefore, become necessary tools, the construction of which demands great strength and simplicity. The building of steam hammers has been taken up on the Continent to a considerable extent by the Markische Maschinenbau-Anstalt, formerly Messrs. Kamp & Co., of Wetter-on-the-Ruhr, in Westphalia, who are the exhibitors of the large steam hammer in the central part of the Machinery Hall at the Vienna Exhibition, a hammer of which we publish this week an illustration, for which we are indebted to our English contemporary, *Engineering*. This hammer is an original design of the firm above named, which has been continually improved and simplified from practical results during the last seven or eight years, so that the hammer, as shown at Vienna, may be considered to fairly represent its makers' latest practice.

It lies in the nature of a steam hammer that the greater the effect upon the pieces to be forged the greater are the destructive consequences with respect to itself. The proper acknowledgment of these consequences forms the principle upon which the design has been based, the problem being to counteract the effects in the most efficient manner. Referring to our illustration, it will be seen that the standards of the hammer, carrying on the top the steam cylinder, are placed on a wrought iron girder, supported by two wrought iron columns, an arrangement which gives a certain elasticity to the whole construction, while at the same time it affords a larger space around the anvil of the hammer, and thus facilitates the free movements of the workmen. For most cases a span of 20 ft. from center to center of the column will be sufficient, whilst for the manufacture of very difficult forgings, a span of 25 ft. may be useful. The span in the 15-ton hammer, shown in our engraving, is 20 ft. 9 in.

The two heavy cast iron standards offer a sufficient mass for counteracting the heavy and destructive rebounding blows of the hammer. The wrought iron bridge keeps these masses of iron firmly together, and prevents any giving way of the uprights. These latter are not only connected by a number of tightly fitted bolts, but both uprights or standards are also fitted closely against the upper and lower cover plates of the girder, so that a movement would necessitate the shearing of all the rivets that pass through the plates.

The arrangement and working of the hammer is very simple, and will easily be understood from the engraving, but we may state that the piston and piston rod are made of best crucible cast steel, and that the hammer is single acting, and is provided with double seated equilibrium valves, which are worked by hand.

The weight of the top of the hammer is, as stated above, 15 tons, the height of fall 8 ft. 3 in., the diameter of the cylinder 3 ft. 8 $\frac{1}{4}$ in. (1.08 m.), and the total weight of the hammer without block and anvil is 87,500 kilogrammes, or 87 $\frac{1}{2}$ tons, distributed in about the following manner: Each upright, or standard, 14 $\frac{1}{2}$ tons; cylinder, 5 tons; bed-plate for cylinder at the top of uprights, 5 $\frac{1}{2}$; bed-plates for foundation, 7 tons; each wrought iron column, 2 $\frac{1}{2}$ tons; bridge, 6 $\frac{1}{2}$ tons; top, with piston and piston rod, 15 tons. Considering the insufficient lifting appliances that were available in the machinery hall of the Vienna Exhibition during the time of installation, the erection of this hammer was a work of considerable difficulty. The chief dimensions of the other hammers built by the Markische Maschinenbau-Anstalt on the same system are:

Weight of Top.	Height of Fall.	Diam. of Cylinder.
15	8 3	3 8 $\frac{1}{4}$
10	7 8 $\frac{1}{4}$	3 1
7 $\frac{1}{2}$	6 10	2 10
7 $\frac{1}{2}$	5 2	2 10
5	5 2	2 6

The two last named hammers are used for the forging of disc wheels, and work with steam acting above the piston, whilst the others act by their own weight only. All the hammers are provided with hand-worked valves.

The Milwaukee Iron Company and its Works.

(Correspondence of *The Iron Age*)

MILWAUKEE, Wis., Aug. 15, 1873.

Although it is only within a very few years that Milwaukee has enjoyed the advantages resulting from the establishment of iron manufacture within its limits, it has already developed a capacity for growth and progress in this direction which give promise that, at no distant day, it will become one of the most important iron manufacturing centers on the

lakes. With a population of eighty thousand, a lake frontage and harbor of more than average excellence, and an extensive and far reaching railway system, there is no apparent reason why Milwaukee should not take a position in the front rank of iron producing and manufacturing cities. Wisconsin yields an abundance of ores of good quality, and many sources of supply have already been opened and brought by railway lines within easy distance of the city. One of the most prominent locations, at present, from whence are obtained iron ores, is the famous Iron Ridge, of Dodge county, owned and operated by the Wisconsin Iron Company, of Milwaukee. This ore is called, geologically, an upper salurian brown hematite. At these

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This company began operations with a capital stock of \$250,000. The business was then, and until 1870, confined to rerolling railroad iron, and amounted to about \$250,000 a year. At this time they occupied but one building, the rail mill, 180 by 211 feet, and gave employment to only 180 men. In 1870 they greatly increased the works, and added a blast furnace, 17 feet bosh and 66 feet high. The same year

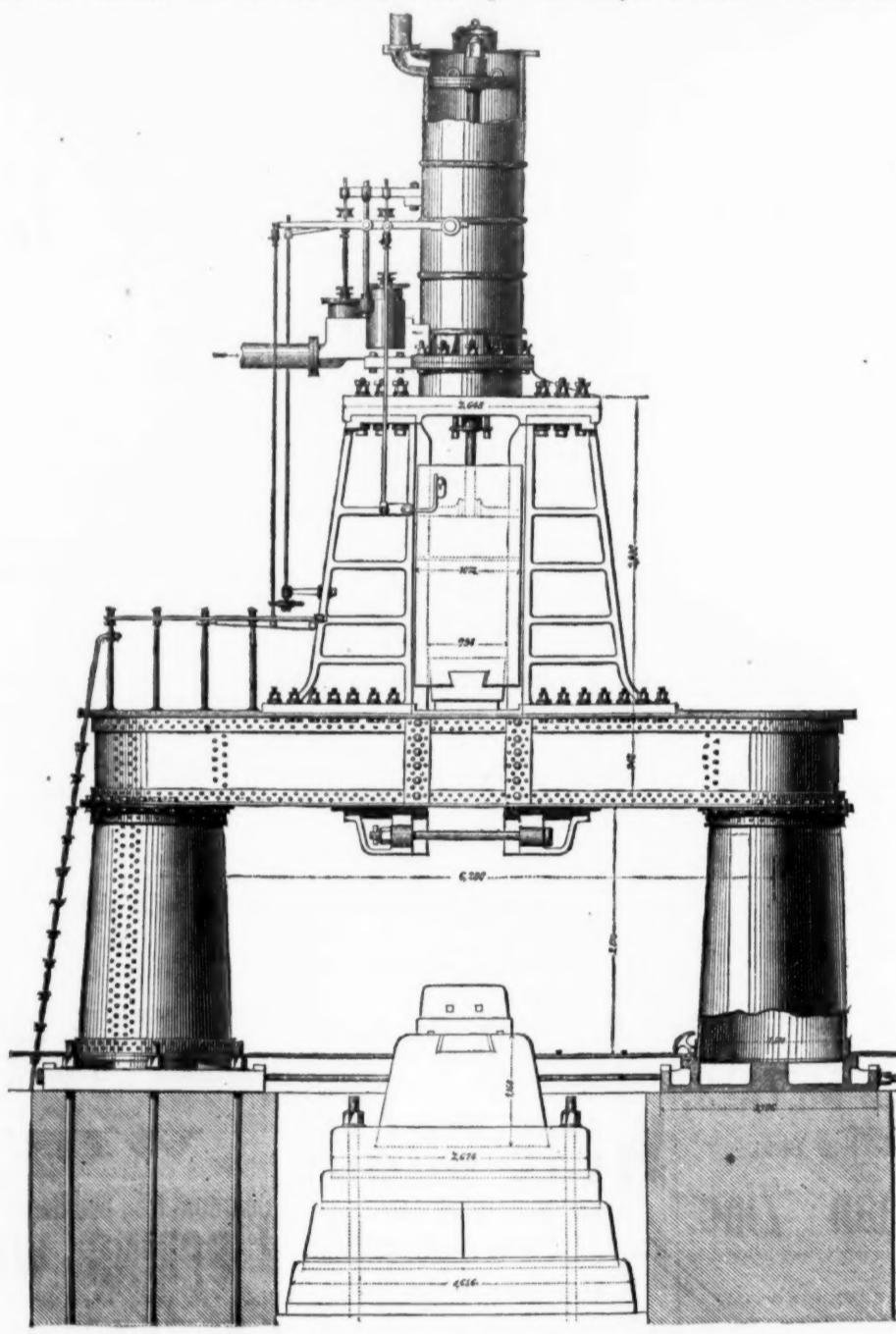
iron. A number of vessels are employed during the season of navigation in transporting this ore from Escanaba, and 140 cars are in constant use bringing ore from Iron Ridge and for use in the yards and on the dock, which is 1400 feet in length. The pile of ore now on the ground for winter use is immense, while the cars are daily bringing fresh supplies.

The fuel is mostly brought long distances. There were used at the works last year 55,000 tons of bituminous coal brought from Ohio, 25,000 tons anthracite from Pennsylvania, and 20,000 tons coke from Connellsburg, Pa. The two former are brought by water and the latter by rail, obtaining cheap freightage in grain vessels and stock cars on their return trips.

ing on its operations. The officers are: Captain E. B. Ward, president; Hon. Alexander Mitchell, treasurer; and J. J. Hagerman, Esq., secretary. The latter gentleman has been general manager of the business of the company since its organization, and to his well directed energy, enterprise and prudence, the company are in a great degree indebted for their financial prosperity.

Asbestos.

A writer in the British *Trade Journal*, discussing the subject of asbestos and its uses, says of it: In the city of Glasgow a manufactory is now being carried on, in which the principal ingredient used is a material hitherto so little known, except among savants, that its very name—"asbestos," is a mystery. When all its properties are known, the substance itself is still more puzzling. In appearance as friable and perishable as thistledown, it is older than any order of animal or vegetable life on earth. So little amenable is it to the dissolving influences of time, that the action of unnumbered centuries, by which the hardest rocks known to geologists are worn away, has no appreciable effect on this strange substance, which is found imbedded in them. With its greater proportion of bulk composed of the most rough and gritty materials known, it is itself as smooth to the touch as soap or oil, and may be made as light and buoyant as feathers. Apparently as combustible as tow, the fiercest heat cannot consume it, and the thready filaments may be mingled with molten brass or iron without losing their characteristic form. Finally, no combination of acids at present known in any way affects the appearance and strength of its fibre, even after days of exposure to their action. The name of this article is derived from the Greeks. "Asbestos" literally means "indestructible"—a title which is very thoroughly earned by this strange substance. It is, moreover, so unassassable by all known solvents that it is a virtual impossibility to analyze and give its component parts with exactness. Enough, however, is known or guessed at, to enable us to speak of it as consisting of from fifty to sixty parts silex, ten to twenty parts magnesia, about the same proportion generally of aluminium, some traces of protoxide of iron, and occasionally a lime-like mixture. These proportions vary greatly in the hundreds of different varieties of asbestos known, and govern and regulate exactly its value for practical purposes. Asbestos is a mineral. It is found in nearly every part of the world, and occurs in distinct veins and seams, usually in the serpentine formation of rocks. In order to procure it, it is necessary to mine in regular form, and to work the lodes or seams by blasting and tunneling. This, in many cases, is a very costly process, as the rock in which it is found is extremely hard. The seams vary greatly in size, width, color, and general appearance in different parts of the world. In fact, no two are exactly alike, but they have almost universally the same dip and inclination. The marvelous properties and consequent prospective value of asbestos to mankind have been known to some extent and appreciated for thousands of years, and vast sums of money have been expended in endeavoring to make it available; but up till within a few years these experiments have for the most part resulted in failure, from the fact of the varied and dissimilar peculiarities of the different species—such, for instance, as the length, strength, and fineness of the fibre, excess of magnesia or aluminium, &c., being unknown. Having neither experience nor theory to guide them, the experimenters have invariably misdirected their energies by using the wrong or the unselected and unprepared species for their different works, and consequently their efforts have been unavailing. The rock upon which all have heretofore split has been the mistaken impression that all asbestos is of the same nature. This is correct in the abstract. It is true that all asbestos is extremely refractory—insensible to the action of acids, moisture, or decay. Yet it is not true that all asbestos may be treated alike, or, if treated alike, similar results will accrue. For instance, paper can be made from asbestos, and of excellent quality too. Still there is only one or, at the furthest, two kinds of asbestos that can be made into paper at all, and that only by proper and peculiar treatment. This also is the case as to thread and cloth, and, in fact, with reference to any and all other applications of asbestos. A new and important use for this substance is for steam packing. In this particular branch of manufacture, more than any other, is a thorough knowledge of asbestos necessary, for so destructive are the influences to which steam packing is exposed, that out of samples from more than one hundred mines in the United States, Scotland, Ireland, the Shetland Islands, Wales, Savoy, Piedmont, Germany, Austria, and Corsica, only two have been found which answered the purposes at all, and one of these only indifferently. The complex requisites in asbestos to make satisfactory packing are so numerous and peculiar that it would be tiresome to enumerate them. The manufacture of asbestos steam packing is a simple and beautiful process. The raw material is brought to the manufactory in sacks, and looks like chips and blocks of wood, but of beautiful color. Experiments and study have revealed the best method of disintegrating and picking apart these chips and blocks, and reducing them to a fibrous condition like flax, jute, or cotton. The material once properly opened, it is, by means of machinery, which is both simple and ingenious, formed into packing of the usual market sizes. These machines are as easily attended as weaving looms, and each is under the care of a young woman, who, after a short time, becomes expert in the business, and is capable of turning out a first-class article. It is compactly reeled up in coils as made, and, when of proper size, is securely tied, covered with bagging, and sent to all parts of the world. The practical uses to which it is not only possible but probable that asbestos will be put are almost numberless. Asbestos boats, tubs, boxes, wagon bodies, and even railway carriages, which will neither rot, burn, nor splinter, are perfectly practicable and possible.



FIFTEEN TON STEAM HAMMER, BY THE MARKISCHE MASCHINENBAU-ANSTALT.

mines the supply is practically inexhaustible. This locality is only some 40 or 50 miles from Milwaukee, and in direct communication with it by rail. Beside the mine above referred to, the Milwaukee iron masters obtain ores from Missouri, Lake Superior and Michigan. From the two latter sources it is freighted directly by rail, and lake vessels, to the wharves of the furnaces.

In the following year was built another puddling mill having 19 furnaces. This locality is only some 40 or 50 miles from Milwaukee, and in direct communication with it by rail. Beside the mine above referred to, the Milwaukee iron masters obtain ores from Missouri, Lake Superior and Michigan. From the two latter sources it is freighted directly by rail, and lake vessels, to the wharves of the furnaces.

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furnaces. In the following year was built another puddling mill with 20 furnaces; and another blast furnace, similar to the first, the two side by side. Various additions were also made to the rail mill; and last year the products of the works amounted to \$3,000,000. More recently they have added a "top and bottom" mill to make flats for rails, increasing the capacity of the establishment by about 10,000 tons a year.

Of blast furnaces the company have two, both

of excellent "bottom."

Their dimensions are 67 x 17 feet, and together they ran 37,347 tons of pig metal last year—a large yield for furnaces of this size. The iron, which is made of Iron

Ridge and Lake Superior ores, is said to be of

extra quality for rail making purposes, when

the ores are mixed in about the proportion of

three-eighths of the former to five-eighths of the latter.

Of the ore used at the works 22,000 tons

are brought from Escanaba in vessels direct to

the company's docks, and 40,000 tons from Iron

Ridge on the St. Paul Railroad direct to the

works. The company owns two-fifths of the

contracts for the heavy iron work necessary

for the rolling mills and furnaces to Milwau-

kee mechanics. Every foundry and engine

shop was put into requisition to furnish cast-

ings, boilers and engines for them. Their

works also gave employment to hundreds of

other mechanics and laborers, thus greatly

stimulating all local industries. Not only

this, but the beneficial influence of this com-

pany is acknowledged in the enhanced value of real estate in and about the city. Property in the vicinity of the works, which a few years ago could be purchased for fifty dollars per acre, is now, in some instances, worth a thousand; while real estate in every part of the city has advanced at least fifty per cent.

A number of vessels are employed during

the season of navigation in transporting this

ore from Escanaba, and 140 cars are in constant

use bringing ore from Iron Ridge and for use in

the yards and on the dock, which is 1400 feet

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The fuel is mostly brought long distances.

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The two former are brought by water and the latter

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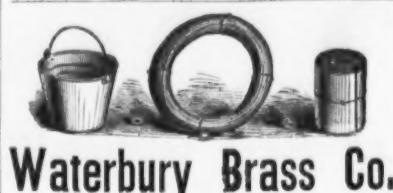
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COAL HOD,



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These Hods are far superior to the old style of All Iron Hod, as the bottom and foot is made of one piece of light and tough wood, which will not rust, split, break, or become ragged in the foot or rim, like the old style, and there is not the least danger of punching holes through or knocking the bottom out.

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New Patents.

We take from the records of the patent office at Washington the following specifications of certain patents lately issued, which will be found interesting:

IMPROVEMENT IN COMBINED ROTARY BLAST AND PUDDLING FURNACES FOR MAKING WROUGHT IRON DIRECT FROM THE ORE.

Specification forming part of Letters Patent No. 138,429, dated April 29, 1873, issued to John Neville, of Jersey City.

Figure 1 is a perspective view; Fig. 2 a central longitudinal vertical section; Fig. 3 a cross section of the rotary blast furnace at x x in Fig. 2.

This invention relates to a combined blast and puddling furnace designed for making puddled iron direct from the ore, the ore being smelted by the waste heat of the puddling furnace, the process being continuous; also, to the employment of superheated steam in the smelting process for deoxidizing the ore, the object being to produce a superior quality of metal, with a saving of the cost of the fuel used heretofore in smelting the ore; and to this end it consists in the combination of a peculiarly constructed rotary blast or smelting furnace with a puddling furnace, and in the employment, in connection therewith, of superheated steam, in the manner and for the purposes hereinabove set forth.

In the drawing, A represents the walls of an ordinary puddling furnace, in which a is the ash-pit; b, the fire-place; c, the bridge-wall; d, the hearth; e, the back bridge-wall; f, the door for charging the fire-place; and g, the door in the side for working the boiling iron. The process is as follows: Take of the ordinary oxide of manganese about ten parts, by weight, to three parts of solid carbon, such as charcoal, coke, or anthracite coal, or the equivalent thereof of gaseous carbon. Both these ingredients are preferably pulverized, and when mixed thoroughly are inclosed in cases or boxes of suitable material, either metallic, or made of silicious or aluminous earths. These cases, or boxes, may be of any suitable size for containing any desired charge. They are preferably made close, except at one end, where the charge is introduced, and which is subsequently closed with a covering of charcoal, clay, or other like substances, such as will permit the escape of the gases evolved in the process of reduction, but which will prevent the entrance of atmospheric air in injurious quantities.

Instead of this covering of charcoal and clay, a loose metallic sheet may be advantageously employed with a sand covering around the edges, in which case, as the bulk of the charge lessens in the process of reduction, the loose plate will follow it down. These boxes, or cases, are then charged into any suitable heating furnace, such, for example, as the ordinary reverberatory furnace, and are there raised to temperature less than melting heat—say, a bright red or bare yellow—and after the contents are well heated through they are continued subject to this heat for about from twelve to fifteen hours, according to the quantity. The manganese employed in this process may be either protoxide or peroxide. In the process described the carbon unites with the oxygen and

carbonic oxide, and gives as a product manganese nearly or quite pure.

The product thus obtained is employed to secure spiegelisen or ferro-manganese, in the following manner: Melt the pig iron in the ordinary way, but, preferably, in a reverberatory furnace, and charge into it about twelve per cent. of the manganese produced, as above, and melt the manganese therein. Where the manganese is reduced in metallic cases it may be charged into the molten metal in the box either hot or cold; or it may be compressed into lumps or blooms of convenient size for handling, and charged in that form into the molten pig metal. This proportion of ingredients is run off, when melted, into ingots as spiegelisen, or tapped directly into the Bessemer converter or open hearth, where it is used as spiegelisen, in the ordinary way.

To produce ferro-manganese charge into the molten pig metal a larger proportion of manganese, such as will give in the molten product the desired percentage of manganese—say, twenty-five or thirty per cent., more or less—and run off into ingots or tap off into the converter or open hearth the molten product, as before specified. But, if so preferred, the pig metal and reduced manganese may, in the proportions above indicated, be melted together in the reverberatory furnace, though less advantageously.

The manganese, as produced by the process first described, is used advantageously by charging the same while inclosed in its case or box; or, when compressed into blooms, directly into the molten steel of the Bessemer converter or the open hearth. The manganese counteracts red-shortness in the steel, apparently by uniting with the free oxygen or metallic oxides which may be in the steel, and in this mode of using it is particularly useful in the manufacture of boiler plate steel. From one-half to one per cent. of manganese will ordinarily give the best results in this use.

Claim 1. The reduction of manganese in close boxes, or cases, in a suitable furnace at less than a melting heat, with or without the introduction of iron.

2. The manufacture of spiegelisen and ferro-manganese by charging the unmelting, or metallic, manganese produced, as set forth, either in boxes or in blooms, into pig metal previous to or after melting.

3. The charging of metallic manganese, either in cases, or blooms, into a bath of molten steel, substantially in the manner set forth.

pose of deoxidizing the ore by its affinity for the hydrogen of the steam.

Claim 2. The arrangement of the pipes D D' with relation to the stack B and retorts C for supplying superheated steam thereto, substantially as described and shown.

IMPROVEMENT IN THE MANUFACTURE OF MAN-GENESE, FERRO-MANGANESE AND SPIEGELEISEN.

Specification forming part of Letters Patent No. 141,419, dated August 5, 1873; issued to Ogden Bolton, Jr., of Pittsburgh:

The nickel is improved for the purposes of this alloy by a preliminary process of refining, as follows: Take, say, one hundred pounds of the nickel, melt it and continue the heat till the nickel boils or bubbles in the center. If the nickel shows cobalt in excess, add about two ounces of soda-ash as a flux and stir till the nickel boils or bubbles in the center. If the nickel shows arsenic, common salt in same quantity may be used as a flux. If the nickel shows sulphur, carbonate of soda in about the same quantity may be used as a flux. The nickel may now be cast into sheets, and is now refined and purified.

The alloy is to be produced by melting the zinc in any proper manner, as in a crucible, keeping the zinc covered meanwhile with powdered charcoal or other equivalent carbonaceous matter. The heat is continued after the zinc is melted under the cover of the charcoal. When raised to a trifle above the melting point of copper the nickel is added in small strips or pieces, and the heat continued till the whole is melted; the melting metal being kept covered all the while with the powdered charcoal, and when melted the alloy is cast into ingots, the charcoal flowing out with the alloy and forming a coating on the ingot. The whole is allowed to cool together.

This alloy is specially useful in making German silver. By remelting this alloy under charcoal as before, and adding copper till the per centum of nickel is reduced to anywhere from one to twelve per centum of the whole, a good German silver may be formed, the richness of the metal varying with the per centum of the nickel.

This alloy, when added to any metallic compound containing copper, bleaches, whitens, and strengthens it.

Common pin metal is usually composed of two parts of copper to one of zinc. By adding this alloy till there is a full quarter more of zinc in the composition, a cheaper article and, at the same time, a better one may be produced.

Claim 3. An alloy of copper, nickel, and zinc, in about the proportions specified.

IMPROVEMENT IN ALLOYS OF NICKEL, ZINC AND COPPER.

Specification forming part of Letters Patent No. 141,530, dated August 5, 1873; issued to Howell W. Wright, of Glastenbury, Connecticut:

This alloy consists of American commercial nickel (which contains about twenty-five per centum of copper) and zinc in about the proportion of one hundred pounds of zinc to from twenty-five to thirty-four pounds of the American commercial nickel.

The nickel is improved for the purposes of this alloy by a preliminary process of refining, as follows: Take, say, one hundred pounds of the nickel, melt it and continue the heat till the nickel boils or bubbles in the center. If the nickel shows cobalt in excess, add about two ounces of soda-ash as a flux and stir till the nickel boils or bubbles in the center. If the nickel shows arsenic, common salt in same quantity may be used as a flux. If the nickel shows sulphur, carbonate of soda in about the same quantity may be used as a flux. The nickel may now be cast into sheets, and is now refined and purified.

The alloy is to be produced by melting the zinc in any proper manner, as in a crucible, keeping the zinc covered meanwhile with powdered charcoal or other equivalent carbonaceous matter. The heat is continued after the zinc is melted under the cover of the charcoal. When raised to a trifle above the melting point of copper the nickel is added in small strips or pieces, and the heat continued till the whole is melted; the melting metal being kept covered all the while with the powdered charcoal, and when melted the alloy is cast into ingots, the charcoal flowing out with the alloy and forming a coating on the ingot. The whole is allowed to cool together.

This alloy is specially useful in making German silver. By remelting this alloy under charcoal as before, and adding copper till the per centum of nickel is reduced to anywhere from one to twelve per centum of the whole, a good German silver may be formed, the richness of the metal varying with the per centum of the nickel.

This alloy, when added to any metallic compound containing copper, bleaches, whitens, and strengthens it.

Common pin metal is usually composed of two parts of copper to one of zinc. By adding this alloy till there is a full quarter more of zinc in the composition, a cheaper article and, at the same time, a better one may be produced.

Claim 4. An alloy of copper, nickel, and zinc, in about the proportions specified.

Vapor Power.

The Boston *Globe* says: Mr. William Wells, of Salem, has just perfected an apparatus for running stationary or locomotive engines by vapor power, which, if it fulfills all that is expected of it, will entirely revolutionize the method of running engines of every description. The new apparatus was set up a few days ago, and put in practical operation for the first time, in the presence of several gentlemen well versed in machinery and the application of power. The working of the engine was entirely satisfactory, and all present expressed themselves as highly pleased with the success of the invention, which has been considered by all but the designer as an experiment.

The whole apparatus is very simple in construction, and the new power can be applied to any engine. The whole peculiarity in construction is in the boiler, the vapor being conveyed to the cylinder of the engine just the same as steam. The boiler is an upright one, and is really a double boiler; that is, it has two heads at each end, one a few inches from the other. The two chambers thus formed, one at each end of the boiler, are filled with water, and are connected by tubes, which are for the circulation of the water between the two chambers.

The second or inner boiler, that between the two inner heads, is filled with a preparation of bisulphide of carbon, the vapor from which is the motive power and takes the place of steam.

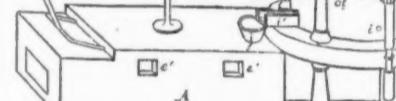
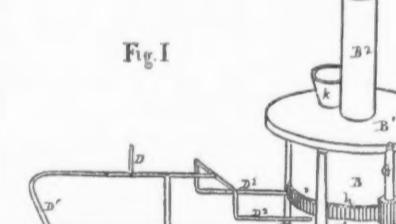
Beneath the boiler is a small fire box, from which flues run up through the two boilers to the smoke pipe. These flues pass inside of the tubes already mentioned, and the fire in passing through heats the chemicals. By this arrangement it will be seen that the bisulphide in the inner boiler receives the requisite amount of heat without coming in direct contact with the fire flues, as the water, as has been explained, is kept in circulation through the tubes. Mr. Wells claims that with a comparatively small amount of power can be obtained, and it has been practically shown that with the water at a temperature of 212 degrees Fahrenheit, or the boiling point, a pressure of sixty-five pounds to the square inch is obtained on the vapor boiler, and, of course, if a greater heat is applied to the water, the vapor pressure will increase proportionally.

It should be mentioned that the chemical preparation is used over many times, as the vapor, after passing through the cylinder of the engine, passes into a condenser, and is then returned to the boiler to be used again. The waste of chemical material is said to be very small. It is estimated that at least two-thirds of the amount of fuel can be saved by the use of this invention, but the exact amount can be better determined after further experiment.

Mr. Wells has been at work eight years in perfecting this apparatus, and, judging from the recent test, his labors and pains have not been thrown away. The engine is to be put in daily use at the planing mill of David Bullock, on Front street, Salem, in a short time, and all interested can have an opportunity to judge of the merits of this invention for themselves.

Gilding on Iron.

An improved method of gilding on iron and similar metals has been introduced by Herr W. Kirchmann. The surface of the metal, even when oxidized, may be prepared by treatment with sodium amalgam; chloride of gold is then poured over the amalgamated surface, and by application of heat the mercury may be expelled, leaving a uniform film of gold capable of receiving a polish.



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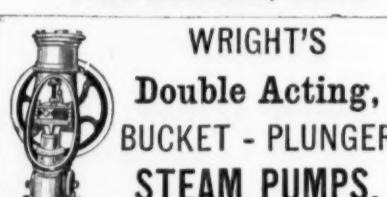
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(Concluded.)

TANGENTIAL VALUE ILLUSTRATED BY GRAVITATION.

The considerations thus far given might be deemed complete and abundant, but practical engineers resort to illustrations by the force of gravitation, representing the average crank obliquities by the inclined plane, when by an indiscriminate or improper use of the conditions pertaining to it, they claim that the lesser resultant equals the greater primary.

We, therefore, define and illustrate the correct relation of values by gravitation, and shall show that gravitation, by the same mass over the pulley, can raise 42½ lbs. 16 feet high in 1.57 seconds, whilst by the plane no weight can by any possibility be raised.

Also, shall show the mechanical value by the inclined curve, and that gravitation, by the same mass over the pulley, can raise 33½ lbs. 16 feet high in 1.41 seconds, whilst by the curve or crank arc no weight can by any possibility be raised.

And these practical truths establish the loss of power under the well known laws of gravitation, unequivocally.

In Fig. 4 we have by the pulley a simple standard of gravitation, and in Fig. 5 the average obliquities of the crank, shown by the inclined plane.

To pulley A we have mass m (of 100 lbs.) at

$F_{g, A}$.

Fig. 5.

$F_{g, g}$.

$F_{g, b}$.

$F_{g, c}$.

$F_{g, d}$.

$F_{g, e}$.

$F_{g, f}$.

$F_{g, g}$.

$F_{g, h}$.

$F_{g, i}$.

$F_{g, j}$.

$F_{g, k}$.

$F_{g, l}$.

$F_{g, m}$.

$F_{g, n}$.

$F_{g, o}$.

$F_{g, p}$.

$F_{g, q}$.

$F_{g, r}$.

$F_{g, s}$.

$F_{g, t}$.

$F_{g, u}$.

$F_{g, v}$.

$F_{g, w}$.

$F_{g, x}$.

$F_{g, y}$.

$F_{g, z}$.

$F_{g, a'}$.

$F_{g, b'}$.

$F_{g, c'}$.

$F_{g, d'}$.

$F_{g, e'}$.

$F_{g, f'}$.

$F_{g, g'}$.

$F_{g, h'}$.

$F_{g, i'}$.

$F_{g, j'}$.

$F_{g, k'}$.

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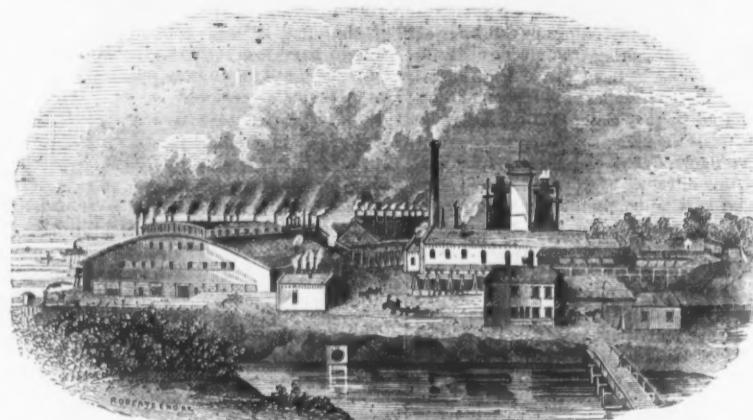
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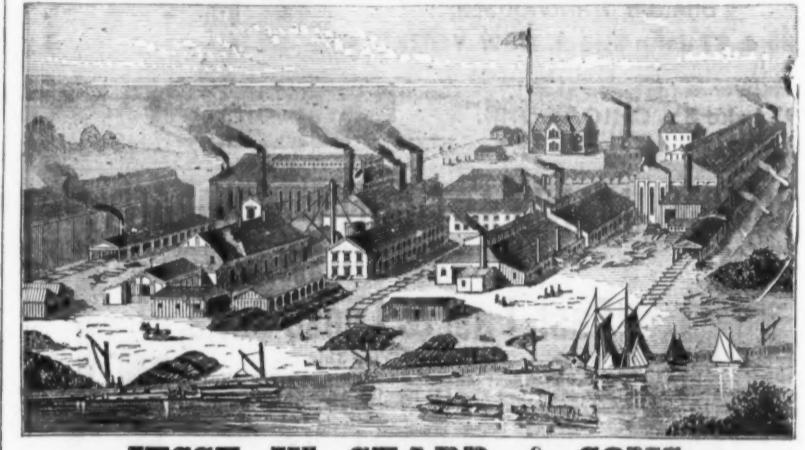
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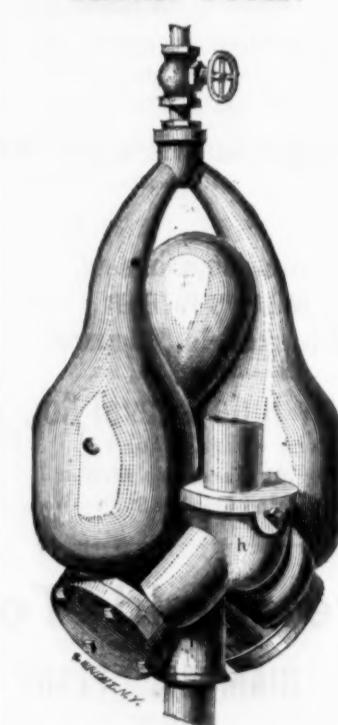
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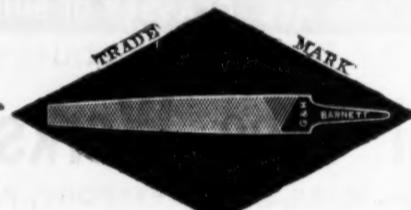
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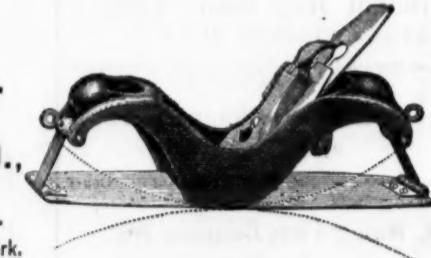
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MACHINISTS,
and Manufacturers of
Sewing Machines,
Steam Fittings,
AND
LIGHT WORK of all kinds.
ALSO
Plain and Ornamental
Japanning,
20 to 30 Merton, and 57 to 65
Clymer Streets,
BROOKLYN, E. D., N. Y.

**Real Bronze Door Knobs,
BUTTS, &c.
Golden Bronze Knobs
AND
HARDWARE.**

Round and Hexagon inside and outside Door Knobs, and combined Escutcheon; beautiful patterns and superior finish, retaining color; Real Bronze. The list includes several SPECIALTIES, the cheapest and best bronze work offered. Bell Pulls, Sash Lifts, Shutter Bars, Sash Fasteners, Escutcheons, Bell Levers, &c.

**JAMES E. HALSEY, Sole Agent,
76 BEAUFORT STREET, NEW YORK.**

BUSINESS ITEMS.

NEW YORK.

The Buffalo Steam Gauge Company is filling a second order for 1000 gauges for the Westinghouse Air Brake Company. Beside gauges, the company turns out from 40 to 50 headlight monthly, beside lanterns, cab lamps, &c.

John Daly, president of the Albany Union Foundry Company, has made application that the company be dissolved. The application is based on the fact that the company are now without the means of proceeding in the business in which they were engaged, as their buildings have been sold under mortgage foreclosure, and that they are not now the possessors of any real estate. It appears from the petition, also, that the company ceased to manufacture stoves or iron ware in 1871, and the time intervening has been devoted to the selling of the stock on hand. There were one hundred and two stockholders in the company, representing in the shares owned by them a capital of \$80,000. The assets of the company at present are \$3100-07, principally money in bank, and the debts due \$121.

NEW JERSEY.

Hammered and rolled cast steel are the specialties of the Newark Steel Works. The company employ ninety men and intend increasing the capacity of their mills. They use four steam hammers, three trains of rolls and four engines in their establishment, and their products have gained for them an excellent reputation.

MASSACHUSETTS.

Kilburn, Lincoln & Co., Fall River, manufacture turbine water wheels, cotton looms, shafting, calenders, mangles, hydraulic presses, machinists' tools, steam engines, pipe, heavy castings, and a general assortment of machinery. They employ 200 hands, whose pay amounts to \$10,000 per month.

The business of the Lamb Knitting Machine Company, at Chicopee Falls, is steadily increasing and the company have now on hand numerous orders for their machines from Japan and Germany; their home orders are also extensive for this season of the year.

MAINE.

The Evans Rifle Manufacturing Company, Mechanics Falls, a new organization, will commence the manufacture of guns at once at A. C. Denison & Co.'s machine shop. Almost all the capital stock, \$200,000, has been subscribed.

The scythe factory of Hiram Holt & Co., at East Wilton, will, the present season, turn out about 4000 dozen of scythes, which are shipped to all parts of the country. The company annually consume, in the manufacture of the above, about forty tons of iron and ten tons of steel. They are also engaged in the manufacture of the "Lightning Hay Knife," of which they make about 500 dozen yearly, using some ten tons of iron and ten tons of steel for this class of product. There are twenty-six hands employed in the establishment, who receive monthly \$1400 for their services.

The Northville Scythe Factory, at Newport, is to be enlarged and improved.

PENNSYLVANIA.

The works of the Oxford Co-operative Car Company, at Oxford, are rapidly approaching completion, and work will be commenced on cars in a few weeks. The company has already orders on which to commence. It will construct passenger and freight cars, and is said to have secured a large number of experienced workmen, and to have unusual facilities for shipping cars.

A new merchant iron mill has been erected at Milton, by the Milton Iron Co., which is now in successful operation. W. R. Jenkins, Esq., is president, and P. C. Johnson, Esq., treasurer, of the company.

Another new blast furnace is talked of in progressive New Castle.

The Lehigh Register, of August 13, says: A project is on foot to add a nail mill to the Glen Iron Works, this city, and last week, at the American Hotel, a meeting of capitalists was held to consider a new patent nail machine, and the advisability of adopting it. Mr. H. H. Fisher was elected chairman, and Mr. E. S. Schimer, secretary. A gentleman from Philadelphia was present and explained the superiority of the new machine over the old ones in use, and how nails can be made cheaper by it than by any other. After the matter was thoroughly discussed a committee of five was appointed to go to Philadelphia next week and visit various nail mills and ascertain what kind of nail machines manufacture the cheapest and best. This committee will report, and then definite action will be taken regarding propositions between the men who will supply the money for the enterprise and the patentees of the nail machine, and an offer on the part of the Glen Iron Company will be considered. The committee consists of Samuel Lewis, H. Fisher, Col. T. H. Good, A. G. Renninger, and John Grub.

The Pittsburgh, Fort Wayne and Chicago Railway shops, in Pittsburgh, turn out two complete locomotives per month. They have five-foot driving wheels, and are splendid specimens of workmanship. The company now makes all its own locomotives.

Everything works smoothly and satisfactorily in the new sheet mill at New Castle.

CONNECTICUT.

The Chapin Machine Co., New Hartford, have just completed a new machine for heading g tire blanks and rivets, which will head 50,000 rivets per day. The machine is automatic, taking the wire from the roll. The company employs from 50 to 70 hands, and make specialty of bolt machinery.

The Pratt & Whitney Co., of Hartford, are at the Vienna Exposition with 13 machines. The Prussian government is now ordering its new gun-making machinery from this firm to the amount of hundreds of thousands of dollars.

The Norwalk Lock Works give employment to from 300 to 400 hands.

Sharpe's Rifle Manufacturing Co., Hartford, are working only one-fourth of their capacity upon their military and sporting arms.

The Yale Iron Works, at New Haven, have an order for a pair of very fine engines, with condensers, and all the machinery for a steam yacht for the vice consul of Austria.

The factory of the Washburn Car Wheel Co., at Hartford, is manufacturing 30 steel rimmed wheels daily. The company have now on hand more orders than they can fill in the next six months. The wheels are giving the utmost satisfaction.

RHODE ISLAND.

The Providence Nickel Plating Company was organized at Providence, in 1870, and is now one of the largest establishments of the kind in the country. The company has recently taken possession of new and spacious quarters in Fulton Block, Fulton street, where they employ a large number of hands and operate the most improved machinery, which is driven by a Baxter steam engine. All kinds of nickel plating work are done by the company, which in the three years of its existence has won an extended and enviable reputation. The members of the association are practically skilled in the business and personally superintend all its processes.

OHIO.

The Wrought Iron Bridge Company, at Canton, turn out 125 feet of work per day, employing 100 persons in manufacturing the same. The bridges constructed by this company are of spans, varying from 20 to 350 feet.

The Valley Rolling Mill, Youngstown, has recently increased its facilities for the manufacture of railroad iron, by erecting four new puddling furnaces, two new heating furnaces, and making other additions. The mill is doing a prosperous business.

The Ohio Iron Company, Zanesville, was established 20 years ago, and manufacture pig-bar, hoop and angle iron, light T rails, and railway spikes and axles. The company manufacture 12,000 tons of pig iron and 5000 tons of finished iron per year. They are now erecting a new warehouse 48x80 feet, two stories high, of brick, and are also breaking ground for a finishing mill for 8 to 10-inch trains, the dimensions of the mill to be 80x166 feet. It will be completed by October 1st. The engine will be built by H. & F. Blandy, and is to be 130 horsepower.

A company known as the Union Bridge Company has been organized at Toledo, and has obtained permission from the Board of Public Works of that city to build a bridge over the Maumee River, from a point on the present railroad grounds a short distance below the Lake Shore bridge to a connection with the Toledo, Tiffin and Eastern Road, on the east side. The bridge will enable direct connection to be made between all the roads entering the city. The stockholders in the company are the Toledo, Wabash and Western Railway Company, the Canada Southern Railway Company and the Pennsylvania Company.

The Silicon Steel Works have just erected extensive buildings at Sandusky, and the works will probably get into operation about September 1st. The company will run six puddling and seven heating furnaces. The capacity of the works will be 55 tons per day. Sandusky parties subscribed \$130,000 to the stock. This company also have extensive works at Rome, N. Y.

MICHIGAN.

The blast furnace at Elk Rapids went into blast several weeks ago. This is a charcoal furnace 12 feet at boshes and 48 feet high, with bell and hopper top. When the full blast is put in it is thought the production will be from 25 to 30 tons per day.

Beauregard, Matthews & Co. are enlarging their agricultural implement works at Battle Creek, by building two additions, which connect all their buildings in one.

ILLINOIS.

Fraser, Chalmers & Co., of Chicago, in 1871, succeeded to the business of the Eagle Works Manufacturing Company, which was established as far back as 1843. Since then the five-story building, 160x60 feet, now occupied as their manufactory, has been erected. They turn out an average of 104 boilers and 40 engines a year, and employ 125 men. Their business is largely the manufacture of mining machinery, of which they have sent 600 tons to Colorado and 700 tons to the Lake Superior fields. The amount of iron consumed annually is about 6000 tons.

Vienna Premiums and Sewing Machines.

We copy the following from the New York Herald of August 12th:

"THE REGION OF THE SEWING MACHINES."

"If Dante had been gifted with the spirit of prophecy he would have set apart a region in his Inferno to illustrate the rivalries and emotions of the sewing machine manufacturers of the United States. The conflicts, the misunderstandings, the ambitions, the yearnings for probation and notoriety, the odd, incessant efforts to win medals of progress and renown and merit and honor, which inspire the gentlemen who manage this industry, have given constant motion and life to the American department. So when His Majesty came into the sewing machine department every effort was made by our commissioners to introduce him to each special machine and explain its peculiar qualities. Let me give you a list of the machines in the catalogue, so you may know what His Majesty was asked to do. First, the Howe Machine Company, New York; then the Singer Manufacturing Company, New York; the Whitney Sewing Machine, Paterson, N. J.; the Wheeler & Wilson Sewing Machine Company, New York; the Wilson Sewing Machine Company, Cleveland, Ohio; the Wilcox & Gibbs Sewing Machine Manufacturing Company, New York; Ezra Morrill & Co., Derby Line, Vt.; George N. Bacon & Co., London, England; the Weed Sewing Machine Company, Hartford, with the patent effective stop motion of Fairchild's attachment; the Secor Sewing Machine Company, New York; the McKay Sole and Shoe Machine, Cambridge; the Universal Feed Sewing Machine Company. Every exhibitor expected a special visit from the Emperor, and His Majesty, with a patience and courtesy that should be commended, endeavored to visit them all.

"After waiting a few minutes to comprehend the explanations made to him of the advance of the industry so largely represented in America, the Emperor continued his tour of the other departments, especially inquiring of his attendants what different principles were presented by each separate machine, in what respect one machine differed from the other—all of which was explained to him, especially the new principle of the patent stop, or the application invented by Mr. Fairchild, and now owned by the Weed Machine Co., by which the action of the needle is arrested by the pressure of a spring without stopping the motion of the wheel."

In the New York Herald of August 19th we find awards were made as follows:

"To the Wilson Sewing Machines, of Cleveland. Elias Howe Sewing Machine Company, for sewing and stitching. Wilcox & Gibbs Sewing Machine Company, of New York, for best single thread sewing machine. The Weed Sewing Machine Company, for best stop motion machine to sewing machine treads."

"The Wilson Sewing Machine Company being the only exhibitor that received a grand prize medal for the best sewing machine, and medals of honor."

Ford's Pat. Stove for Heating Air for Blast Furnaces

Adopted at 13 different Furnaces.

West Point Foundry,

Cold Spring, N. Y.

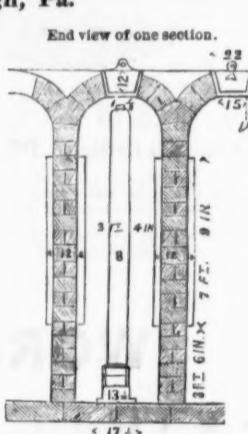
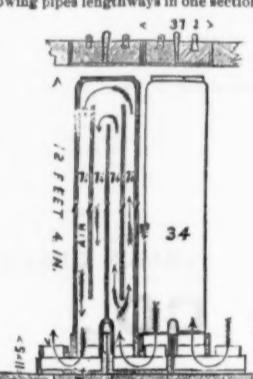
PAULDING, KEMBLE & Co.

30 BROADWAY, NEW YORK, sole Proprietors for the United States

JOSEPH CRAMPTON, Agent.

23 19th Street, Pittsburgh, Pa.

Showing pipes lengthways in one section.



REFERENCE.

PHILADELPHIA, NOV. 16, 1872.

PAULDING, KEMBLE & CO.:

GENTLEMEN: We have five sections of the "Ford's" Ovens in use since blowing in our new Furnace on the 1st of October, and are greatly satisfied with them; we consider them superior to any Cast Iron Oven in use; they heat the air to a greater degree with much less gas and heat on the brickwork than the Player Ovens; they cost less for construction, and, we believe, will prove more durable, and less expensive to keep in repair. Our main difficulty thus far has been to keep the heat down to 1000 deg.; our average is from 1100 to 1200 deg.

In all cases the Cast Iron Key Boxes to form the arch should be filled in lightly with fire-brick blocks, laid dry and covered with loam, or, better, a cast iron plate, to cover the top, with a ring in it, so as to be easily removed.

We built our ovens in one block, entirely of fire brick; the cost of the brick work entire was about 5000 dollars, say about 1000 for each oven.

We can recommend the Ford Ovens with great confidence to iron men who wish to construct the best kind of ovens in use in the United States. Yours, truly,

J. H. MOORHEAD & CO.

P. S.—Our Furnace is now on her 3d week, making about 28 tons per day good Foundry Iron—15 feet high, 50 feet high.

NEW YORK SCREW BOLT WORKS.

(Estate of R. J. DEWHURST, deceased.)

JOHN COCHRANE, Executive Agent and Manager,

Office and Works, cor. Ave. D and 11th St., N. Y.

Bolts, Nuts, Turnbuckles, Washers, Forgings, &c.

The attention of large consumers solicited.

Something New for
OTIS FURNACES & MINES.
New Union Steam Safety Elevator,

How One Works.

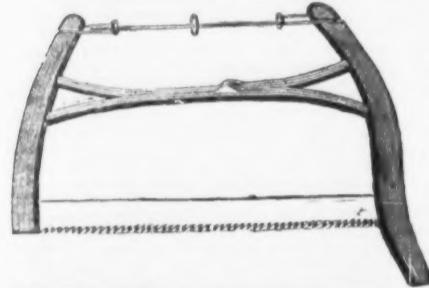
RIVERSIDE IRON WORKS, DEWEY, VANCE & CO.,

Wheeling, W. Va., January 14

HENRY DISSTON & SONS'
SAW, TOOL,
STEEL AND FILE WORKS,
Front and Laurel Streets,
PHILADELPHIA, PA.

Hankins' Elliptic Forked Saw Frame.

Patented June 28th, 1870.



The annexed engraving represents HANKINS' ELLIPTIC FORKED SAW FRAME, which commends itself to the trade for its simplicity of construction. The Forked Arms being all in one piece, without any centre bolt, secures for the Frame great strength and durability.

These Frames are put up with my best Webs, marked "No. 40, Harvey W. Peace."

HARVEY W. PEACE
 VULCAN SAW WORKS,
 WILLIAMSBURGH, N. Y.

AMERICAN SAW CO.

No. 1 FERRY STREET, NEW YORK.



Solid saws require frequent gumming, thereby subjecting them to risk of springing or breaking. This is especially the case with cross cuts having Patent Teeth. In the perforated saws all gumming is avoided, and the teeth are easily kept long and in proper shape, saving time, labor, expense and vexation. As is well known, our saws cut faster, smoother and easier than any other.

MOVABLE-TOOTHED CIRCULAR SAWS AND SOLID SAWS OF ALL KINDS.

W. ROSE & BROTHERS

WEST PHILADELPHIA,

Manufacturers of

Plasterers' and Brick Trowels

Hammers and Chisels.

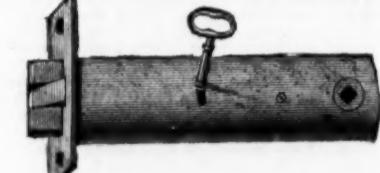
ALSO,

Saddlers' Round Knives, etc.,
 N. E. cor. 36th & Filbert Sts.

Please send for Price List.

Schweitzer Mfg. Co.,

57 Reade Street, New York.



CONTINENTAL LOCKS.

Made of Wrought Iron or Brass, very superior in quality, and only an auger used in mortising.

EXCELSIOR PAD LOCKS,

" COMPASSES,

" DIVIDERS,

ALL WITH

STUBS' STEEL POINTS,

Best and Cheapest Goods in the market. Sole Agents for the United States for

NEWBOULD'S FILES AND TOOLS.

French Coffee Mills.

NOBLE MFG. CO., Tools, Ship Augers, &c.

Emery, Waterhouse & Co., Shovels & Spades,

We also make a superior

AXE. (" Queen of the Forest,"

Disston's Saws. (Largest Stock in the City.)

General dealers in

FOREIGN & DOMESTIC HARDWARE.

Patents. Hose Shield, FLOOR & DOOR CLAMP, &c.

And Eight Sizes Ratchets,

John A. Haase.

216 Vachas St. Phila. Pa.

[SEND FOR CIRCULAR.]

HAASE'S PATENTS.

VIENNA PREMIUMS.

THE WILSON SHUTTLE SEWING MACHINES

Received the Grand

PRIZE MEDAL AND MEDAL OF HONOR

FOR THE

Best Sewing Machine

The Best made Sewing Machines, And Three

Co-Operative Medals FOR

The Best Made Set of Harness, The Best Made Side Saddle, The Best Boot and Shoe Work, And the Best Samples of Cloth Sewing.

No other Sewing Machines received Premiums on their merits, which we will prove by evidence at our office, and that all reports relating to the contrary are false.

AGENTS WANTED,

WILSON SEWING MACHINE CO.,

707 Broadway, New York,

And all other cities in the United States.

ALWAYS COOL STOVE LID-LIFTERS.

Cast in one piece, with improved VENTILATED HANDLE.

Manufactured only by

G. B. WALBRIDGE, 55 Chambers Street N. Y.

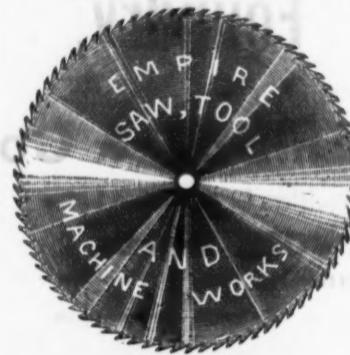


H. W. PEACE,
 MANUFACTURER OF
SAWS OF ALL KINDS.

FACTORY, WILLIAMSBURGH, N. Y.

JAMES ECCLES, ENGINEER

and General Machine Maker,
 2423 2425, 2427 Lombard St., Philadelphia, Pa.



MANUFACTURER OF

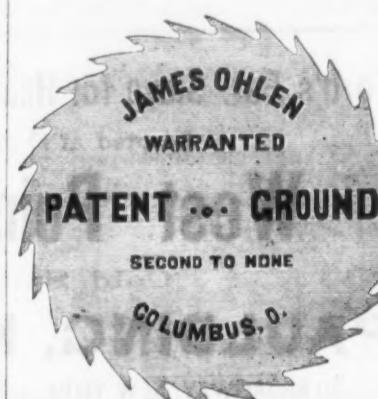
SAWS OF ALL KINDS.

Saw Grinding Machinery

Of the most approved make, on hand and for sale; warranted to grind either straight or to any given taper or bevel. Sole maker of the

Quadruple Screw Power Press.

General Machine Work executed to order.



I make a specialty of the LARGEST SIZES OF Circular Saws, and call particular attention of lumbermen and framers to the following John of the Month.

EVENNESS OF TEETH.—The peculiar structure of my furnace subjects all parts of the saw to a DEAD heat, and when dipped in the oil bath secures perfect uniformity.

PRECISE ACCURACY IN THICKNESS.—My saws are ground on a patent machine, automatic in its operation, grinding off the thick places upon the plate before the thinner parts are reached, and when this is removed BALANCES PERFECTLY, which is proof positive of the right accomplishment of the work.

PROPERLY HAMMERED.—Great care is taken that no saw is ever sent out without being perfectly strained upon the rim, or too loose in the center, cannot be successfully run—hence the importance of so hammering the saw as to effect equal tension of all its parts at the same time. R. TRUE.

This department is under the personal supervision of myself, who has devoted over twenty years to the art of saw making.

I am the proprietor and manufacturer of the celebrated "Challenge" Cross-Cut Saw. Price Lists of all kinds of saws sent on application.

JAMES OHLEN.

WORRALL & CO.,
 MANUFACTURERS OF
EXTRA CAST STEEL SAWS,
 Plastering Trowels, Tools, &c.

Saw Manufactory, Iron Foundry & Machine Shops, ELIZABETHPORT, N. J.
 Office and Warerooms, 28 Elm Street, New York.

J. FLINT & CO.
 Manufacturers of all kinds of SAWS and PLASTERING TROWELS.

ROCHESTER, N.Y.

Dietrich's Patent Wood Saw. Guaranteed the strongest, lightest, easiest to strain and best braced wood saw made; also to give perfect satisfaction.

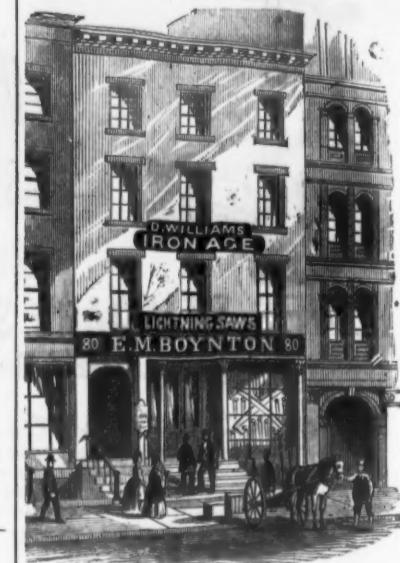
Dietrich's Patent Double Handle Rip Saw. All will readily see the benefit of this useful invention.

J. Flint's Patent Plastering Trowels. The best made and finished Trowels in the world. We make four grades of Plastering Trowels, from the best to the cheapest.

Our patent method of grinding hand saws makes them superior to any in the market.

Send for Illustrated Price List.

WHEELER, MADDEN & CLEMSON,
 Manufacturers of Warranted Cast Steel



BOYNTON'S LIGHTNING SAWS.

Awarded the Medal of the American Institute, 1873.

Two Direct Cutting Edges, instead of one Scraping Point. Note extra steel and durability over the old V, outlined on tools.

A Challenge of \$5000. Reward expense of a public test, to prove that the Lightning Saws exceed all others in Speed, Ease and Simplicity, has been offered since 1870, and has never been accepted. More than 100,000 Lightning Saws were sold during the year 1873, the purchasers of which are mostly satisfied.

Our leading papers, such as the Tribune, American Agriculturist, Christian Union, etc., have published over sixty editorial notices recommending these Saws. Far more can be done to increase the Hardware Dealers unite in pronouncing the genuine Lightning Saw the greatest labor-saving implement of the age.

I have hundreds of letters from practical sawyers, voluntarily written, expressing their entire approval of these Saws.

Where the Hardware Trade do not sell the Lightning Saw, I will send a foot cross-cut and a buck saw-blade on receipt of \$1.

For Catalogue and additional information, address
E. M. BOYNTON, 50 Beekman St., New York,
 Sole Proprietor and Manufacturer.

WM. McNIECE,
 Excelsior Saw Works.

515 Cherry St., Philadelphia.

Manufacturer of

Extra Cast Steel Saws of every description, Pat. Screw Socket Pole Pruning Saws, Patent Screw Socket Edging Knives, Patent Screw Socket Scuffle Hoes, and Patent Screw Socket Paper Hang-ers' Scrapers, Mowing Machine Sections of all patterns constantly on hand.

E. C. ATKINS & CO.,
 Indianapolis, Indiana,
Saw Manufacturers.

Best Cast Steel Patent Ground Saws.

Also, sole Manufacturers of Atkins' Patent

CROSS-CUT SAW HANDLE.

Best Patent Handle in use. Manufactory and Office—Nos. 210, 212, 214 and 216 South Illinois Street.

WHEELER, MADDEN & CLEMSON,

Manufacturers of Warranted Cast Steel

SAWS

of every description, including

Circular, Shingle, Cross Cut, Mill, Hand, Roberts' and other Wood Saws, &c., &c.

Cast Steel Files

of the well known brand of

WHEELER, MADDEN & CLEMSON.

FACTORIES :

Middletown, Orange Co., N. Y.

BRANCH OFFICE:

97 Chambers Street, New York.

BRUNDAGE FORGED HORSE NAILS,

Manufactured from

BEST NORWAY IRON,

by BRUNDAGE & CO., Sold by

WHEELER, MADDEN & CLEMSON.

Middletown, Orange Co., N. Y.

GEORGE GUEUTAL,
 39 West 4th St., New York.

IMPORTER OF

Wood Screws, Steel in Sheets,

BAND SAWS, TOOLS FOR BRAZING, &c.

Bed Screws, Pin Hinges, and Wire Nails a Specialty.

Cutlery.

Landers, Frary & Clark,
New Britain, Conn.,
MANUFACTURERS OF

TABLE CUTLERY

OF EVERY DESCRIPTION. ALSO.

General Hardware,

IN VERY GREAT VARIETY.

298 BROADWAY, N. Y.

HENRY DICKINSON,
Sheffield Cutlery, Files, &c.,

66 & 68 READE STREET (near Broadway), NEW YORK

Manufactory, SHEFFIELD, ENGLAND.

Isaac Milner's Fine Pocket and Table Cutlery.
Howard Bro.'s Medium Pocket Cutlery.
J. B. Osberton & Co.'s Medium Table Cutlery.
Isaac Milner's Razors, Butcher and Hunting Knives.
Hargreaves, Smith & Co.'s "Imperial" Files.
Milner's "X" and Collins' "IXL" Hand Saws.

ROWE & POST,

MANUFACTURERS OF

Shears, Trimmers, Scissors, &c.
No. 120 Chambers and 50 Warren Streets,

NEW YORK.

TRADE MARK.

J. Rowe's XL.

Send for Catalogue.

TRADE MARK.

Etna Shear Co.

JOSEPH S. FISHER,
No. 411 Commerce St., PHILADELPHIA,
AGENT FOR

George Wostenholm & Son,
Washington Works, SHEFFIELD,
Celebrated I-XL Cutlery, Razors, &c.

SOLE AGENT FOR THE UNITED STATES OF
WALTER SPENCER & CO.,
Steel and File Manufacturers,
Rotherham, ENGLAND.

Corporate Mark

(No) SPENCER
ROTHERHAM

Granted 1777



Nixon & Winterbottom,
PYRAMID WORKS, Sheffield, Eng.

Manufacturers of Table Cutlery, Butcher Knives,
Bread Knives, &c., by patent and Improved
Machinery. Agents: U. S. Smith & Hall, 56 & 60 Reade
St., N. Y.; Canada, Thos. Ellin & Co., Sheffield, Eng.

CHARLES PEACE, Jr., Agent.

To distinguish Articles of Joseph Rodgers & Sons'

& Sons' Manufacture, please to see that they bear
their Corporate Mark.

ESTABLISHED 1852.

NEW YORK KNIFE CO.
MANUFACTURERS OF SUPERIOR
Table & Pocket Cutlery,

WARRANTED TO BE MADE OF THE BEST
MATERIAL.

WALKILL RIVER WORKS,
Walden, Orange Co., New York.

THOS. J. BRADLEY, President.

Corporate Mark

PEPPERELL,
MASSACHUSETTS.

Aaron Burkinshaw. AB

My Blades are forged from the best Cast Steel, and
warranted. To me was awarded the GOLD MEDAL of
the Connecticut State Agricultural Society; also a Medal
and Diploma from the Mass. Mechanics' Ass'n, Sept. 1862.

THOMAS TAYLOR,

37 Chambers St., New York,
Agent for

F. W. HARROLD,

Hardware Commission Merchant,
BIRMINGHAM.

JOSEPH ELLIOT & SONS,

Manufacturers of Razors, Table Knives, &c.,
SHEFFIELD.AMERICAN
PEN AND POCKET KNIVES,MANUFACTURED BY PEPPERELL,
MASSACHUSETTS.

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the Connecticut State Agricultural Society; also a Medal
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THOMAS TAYLOR,

43 Chambers Street, New York,
Agent for

HENRY H. TAYLOR,

SHEFFIELD CUTLERY,

Graining Combs. M. H. TAYLOR

Sole Agency in the U. S. for

JONATHAN CROOKES & SON'S

Celebrated Pen, Pocket and
Sporting Knives.

Corporate Mark.

AMERICAN KNIFE CO.,
Thomaston, Conn.,
Exclusive Manufacturer
of Steele's Pat.FOLDING RULE
AND KNIFE.Also, Manufacturers of
all kinds of
POCKET CUTLERY.

Chicago Agency, 123 State St.

CLARK, WILSON & CO., Agents,

51 Chambers Street NEW YORK.

CORRESPONDENCE.

PHILADELPHIA, Sept. 1, 1873.

The importance of the city of Philadelphia to the readers of *The Iron Age*, as the great center of manufacturing, has always made a weekly record of the current events in this city interesting to those engaged in the iron trade in the various sections of our country to which the paper goes. As such has been the case hitherto, there is every probability that with the rapid increase of production, and the stirring events likely to be crowded into the preparation for the Centennial Exhibition, matter of greater interest will be presented for the future.

Inasmuch as the best method of carrying out the plans for this Centennial Exhibition is now the subject of general discussion by the press of the whole country, it is fitting that the journals devoted to the interest of the iron trade should take a prominent part therein. The matter of raising the funds necessary for the successful conduct of the Exhibition may be safely left to the secular press; that subject is outside the pale of our discussion, but the duty of the iron manufacturers of the country in regard to the contributions of their products to the nation's display cannot be too strongly impressed upon them or too often urged.

AMERICAN ORES.

With one or two exceptions, we have no treatise which has classified, located and thoroughly described the character or extent of the deposits of American ores, especially of iron. Fugitive papers upon the ores of various sections have been read before the scientific societies of the country, and are scattered through their proceedings, but the only approach to an all thorough description of the iron ores which is now extant is that by Prof. Lesley, of this city, and which was published in 1839, now fourteen years since. The necessity for such a treatise is patent, and especially for the coming Centennial, but would be incomplete without a collection of the various ores for exhibition, and their proper classification and analysis, and description of their various localities, with the extent of the deposits. It is to be remembered that we open our Centennial Exhibition quite as much to advertise our natural wealth, our mechanical ability, and our superiority—or inferiority—of production to the world, as to celebrate the one hundredth anniversary of our national existence. As we shall do the former, so shall we deserve and derive material benefit, increased capital, immigration and development from the heavy expenditure necessary.

The mill of Stephen Robbins, in Kensington, which has been thoroughly repaired and rebuilt is about resuming, and the blast furnace now being built by the same owner is approaching completion. A new blast furnace has been proposed, to be located at Point Breeze, on the Schuylkill, but may be delayed by dull times. Of the iron trade much might be said; that there is a certain improvement and greater inquiry is clear, but prices vary little, and the margin of profit, as is well known to all, is infinitesimal. The natural result of the rapidly increased production of a given article creating a demand for another, is exemplified in the case of the late developments in the oil region, which have so increased the product of Petroleum as to reduce the price to \$1 per barrel. This, in turn, has created a lively demand for plate and tank iron for oil tankage, which kinds alone present very special activity. There are considerable inquiries for rails, unfortunately coupled with the old and worn out bond collaterals, which will no longer buy iron or steel rails. A general feeling of encouragement is, however, noticeable, and it is probable that another fortnight will show a fair, if not active, demand for iron, both raw and finished. In the line of improved manufactures and processes, several promising items must await my next.

The subject of collecting and classifying the ores of the United States was suggested to the Centennial Commission nearly a year ago, by Mr. J. Blodget Britton, of this city, a metallurgist thoroughly competent for the task, and who only urged, in a spirit of patriotism and for the advancement of metallurgical science that the matter should be put in hand. The plans of Mr. Britton received the endorsement of the various iron associations, and of the majority of the manufacturers of the country at the time, but nothing definite has been done by the Commission to that end, apparently for fear of incurring expenditure. The matter now requires prompt and vigorous local action by individual and corporate mine owners, counties and State governments. It is the further simplified since the great ore deposits now supplying the majority of the furnaces of the country are in the hands of but few parties; all of whom who have taken the trouble to exhibit samples of their minerals at Vienna have received medals.

The time is very short for the proper performance of the work, and unless the winter shall see an effort made toward the object in view, the result will be barren.

In no portion of the iron trade is capital more wanted than in the manufacture of pig iron. We are regaled from time to time with accounts of pure pig metals, costing to make but \$14 to \$17 per ton on furnace banks, in Georgia, Alabama, and Tennessee, but we never find these irons, allowing liberally for freight charges, commissions, and a fair profit added, for sale in the seaboard markets. Foreign capital is seeking this country, and it only requires the proper exhibition of our possibilities to secure it for the iron trade.

That Pennsylvania will do her share of the exhibition of iron products there is little doubt, nor is it to be supposed that the city containing the largest locomotive works, car wheel works, and saw works, respectively, in the world, will fail to show their products on their own ground.

It is, however, upon the many manufacturers of tools, of hardware, of stoves, agricultural implements, cutlery, engines, and all their iron corollaries, that we would urge the necessity of now resolving and planning the subject of exhibiting their best specialties at the Centennial, less than three years from us. A special department, to include an entire iron plant, from the ore to the finished steel tool or the Bessemer or Martin rail, the architectural column and the sectional iron ship, would do no more than justice to our progress, or be no more than a fair exponent of our abilities. Moreover, and this is business, our iron manufacturers must remember that if the much talked-of supremacy of the iron trade is to come to us in the near future, we must have customers from abroad, even to the antipodes, and that to secure such customers no better advertising medium will ever present itself than the Exhibition of 1876.

PHILADELPHIA PROGRESS.

Locally, we are progressing surely and rapidly in internal works of use and decoration, included among which are several engineering works of considerable magnitude. Three new iron bridges of large size are being constructed across the Schuylkill River, the largest of which is in the hands of Messrs. Clarke, Reeves & Co., and while, like all their work, being well done, will be the most ornamental bridge in the country. The river front on the Delaware

is being improved by the Pennsylvania Railroad Company, and by the new year a continuous track will be laid along it, bringing the products of the West to the vessels without breaking bulk. In connection with this movement, is a proposition to entirely remove the island fronting the center of the city, and thus give a superior harbor equal to the wants of our reviving commerce, and reviving it surely is, as witness the numerous and increasing lines of ocean steamships now trading from this port. The Reading Railroad Company is grading and preparing the ground at Port Richmond for a large iron shipyard, at which will be built a fleet of a hundred iron steam colliers, upon the plan of those now successfully used by that corporation. The Midvale Steel Works, formerly the Wm. Butcher Steel Company, will in future, it is said, be under the management of William Sellers, Esq., who has made a world wide success of his iron specialty of machine tools, and who will doubtless revive the fortunes of this establishment, which has everything to be desired in the way of locality and plant to compel success. The general manufacturing trade of the city is good, and there is scarcely a works of any description here which has not devoted the dull summer months to improvements. The Pencoyd Iron Works of Messrs. A. & P. Roberts & Co. has just finished a new mill, doubling the former capacity of the works, and which will start at once, and greatly facilitate the production of their specialty of hammered and rolled axles, large rounds, etc.

The mill of Stephen Robbins, in Kensington, which has been thoroughly repaired and rebuilt is about resuming, and the blast furnace now being built by the same owner is approaching completion. A new blast furnace has been proposed, to be located at Point Breeze, on the Schuylkill, but may be delayed by dull times. Of the iron trade much might be said; that there is a certain improvement and greater inquiry is clear, but prices vary little, and the margin of profit, as is well known to all, is infinitesimal. The natural result of the rapidly increased production of a given article creating a demand for another, is exemplified in the case of the late developments in the oil region, which have so increased the product of Petroleum as to reduce the price to \$1 per barrel. This, in turn, has created a lively demand for plate and tank iron for oil tankage, which kinds alone present very special activity. There are considerable inquiries for rails, unfortunately coupled with the old and worn out bond collaterals, which will no longer buy iron or steel rails. A general feeling of encouragement is, however, noticeable, and it is probable that another fortnight will show a fair, if not active, demand for iron, both raw and finished. In the line of improved manufactures and processes, several promising items must await my next.

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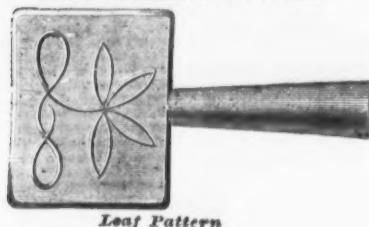
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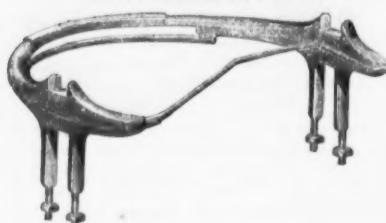
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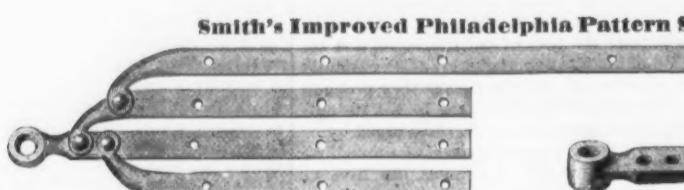
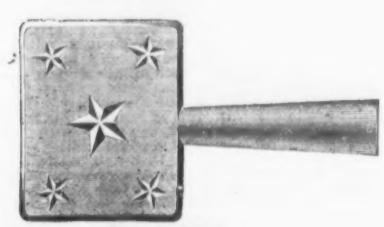
Patent Cross Bar Steps.



Upper View.



Lower View.



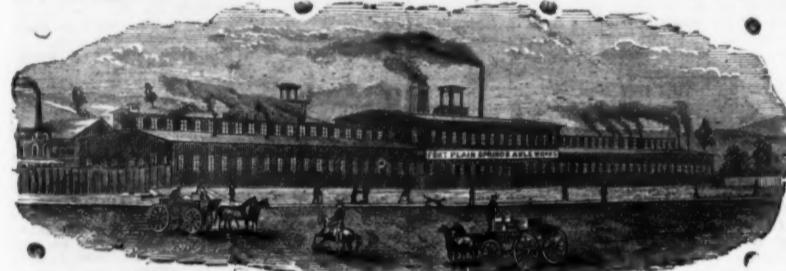
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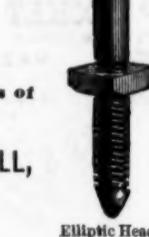
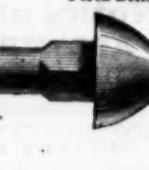
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Judson B., 147 and 149 Water, N. Y.	1
King H. & W., 50 Chambers, N. Y.	1
Peace Chas., 82 Chambers, N. Y.	1
Ward Asline, 161 Duane, N. Y.	1
Whitney John W., 87 Franklin, N. Y.	1
Smith & Hall, 50 and 60 Franklin, N. Y.	1
Taylor Thomas, 45 Chambers, N. Y.	1
Cutter, Manufacturers of.	
Kellogg W. P. & Co., Troy, N. Y.	1
Cutlery, Importers of.	
Boker Hermann & Co., 101 Duane, N. Y.	22
Dickinson Henry, 66 and 68 Beale, N. Y.	11
Fox J. & Son, 100 Franklin, N. Y.	11
King H. & W., 50 Chambers, N. Y.	1
Peace Chas., 82 Chambers, N. Y.	1
Ward Asline, 161 Duane, N. Y.	1
Whitney John W., 87 Franklin, N. Y.	1
Irons, Manufacturers of.	
Lushong & Co., 81 Beckman, N. Y.	1
Britannia Iron Works, Middlebury, Eng.	1
Brown & White, 125 Broadway, N. Y.	1
Miller Bros. Cutlery Co., W. Meriden, Conn.	11
New York Knife Co., Walden, N. Y.	11
Plant Brothers, Birmingham, England.	15
U. S. Steel Sheet Co., W. Meriden, Conn.	12
Differential Pulley Blocks, Makers of.	
Van Wart & McCoy, 85 Chambers, N. Y.	21
Dog Collars.	
Morceran W. T. & J. 62 Duane, N. Y.	15
Door and Gate Springs.	
Palmer & Gray, 25 Elm, Clifton, N. J.	22
Van Wagner & Williams, 21 Park Row.	15
Dredging, and Makers of Dredging Machines.	
Am. Dredging Co., 214 S. Delaware ave., Phila.	31
Drill Chucks, Manufacturers of.	
Hubbard & Curtis Mfg. Co., 82 Chambers, N. Y.	15
Drilling Machines, Makers of.	
Miller Falls Co., 78 Beckman, N. Y.	21
Dovetail Joints.	
Thorne & Dehaven, Philadelphia.	30
Dumping Truck for Bar Iron, Lumber, &c.	
Austin J. & Co., 168 Fulton, N. Y.	6
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Bradley G. W., 51 Chambers, N. Y.	8
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The Union Stone Co., 16 Exchange, Boston.	9
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Concord, N. H., 125 Franklin, N. Y.	11
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New York Knife Co., Walden, N. Y.	11
Plant Brothers, Birmingham, England.	15
U. S. Steel Sheet Co., W. Meriden, Conn.	12
Faucets, Self-Measuring, Makers of.	
Enterprise Mfg. Co., Pa., Phila. and N. Y.	20
Files, Importers of.	
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Dickinson Henry, 66 and 68 Beale, N. Y.	11
Fox J. & Son, 100 Franklin, N. Y.	11
Frasier Peter A. & Co., 55 Fulton, N. Y.	2
Homer Foot & Co., Springfield, Mass.	6
Morse F. W., 50 John, N. Y.	2
Smith D. R., 100 Franklin, N. Y.	2
Spear & Jackson, 98 Chambers, N. Y.	2
Furniture, Manufacturers of.	
Bennett G. H. & Co., 48 Richmond, Phila.	8
McAfee & Co., 174 and 176 N. 6th, Phila.	8
Nicholson File Co., Providence, R. I.	8
Whittemore D. H., Worcester, Mass.	10
Guns, Manufacturers of.	
Bennett G. H. & Co., 48 Richmond, Phila.	8
McAfee & Co., 174 and 176 N. 6th, Phila.	8
Nicholson File Co., Providence, R. I.	8
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Schooverling & Daly, 84 and 86 Chambers, N. Y.	18
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Kellogg E. C. & Co., Hartford, Conn.	15
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Minot & Co., Oliver, Boston.	2
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Walbridge Geo., 53 Chambers, N. Y.	2
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McGraw, 24th below Caldwells, Phila.	12
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Pease, 24th below Caldwells, Phila.	12
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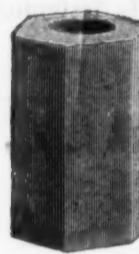
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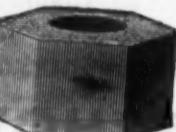
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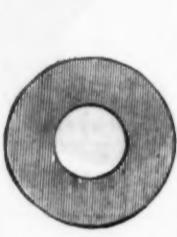
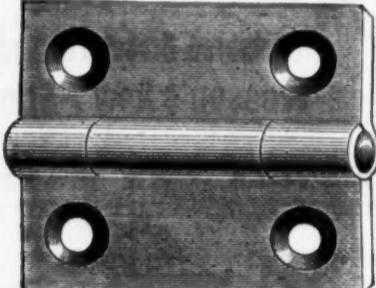
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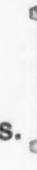
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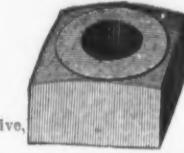
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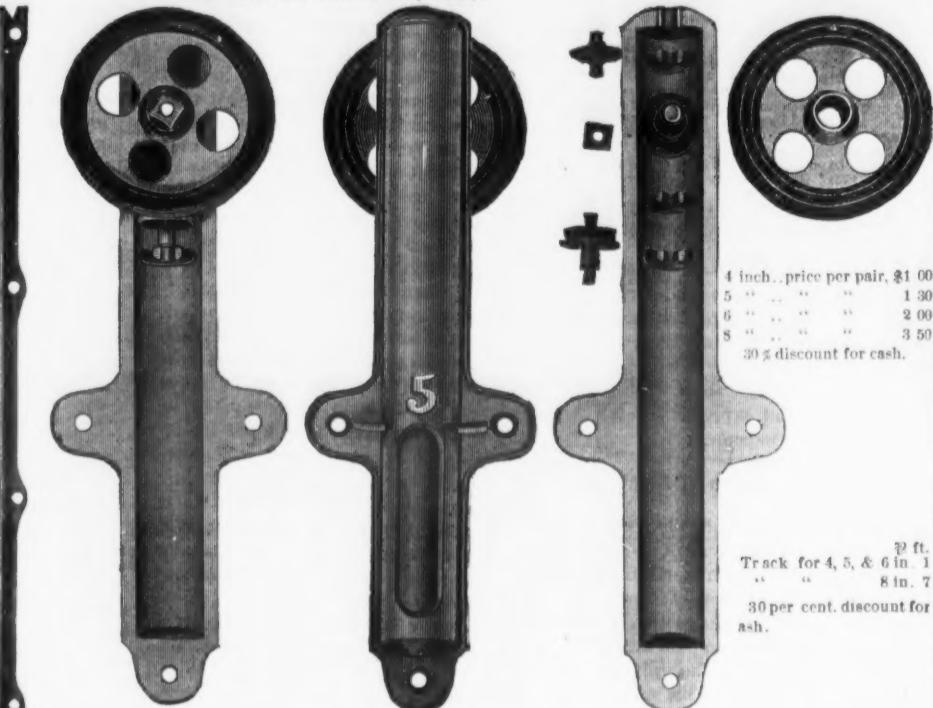
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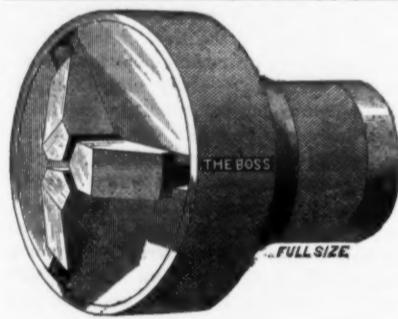
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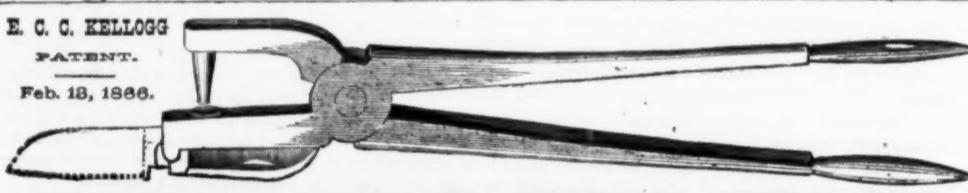
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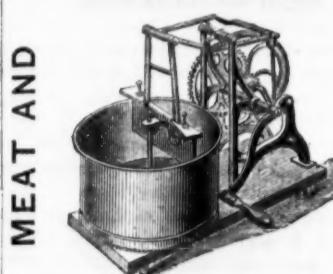
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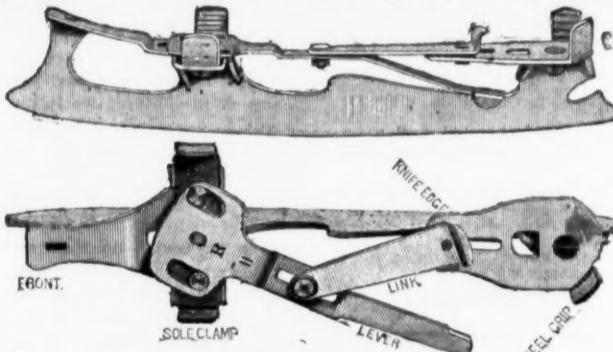
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Twenty-ninth Page.—Boston, St. Louis, Chicago, Detroit, Cincinnati and London Hardware and Metal Prices.

The Proposed Visit of the Iron and Steel Institute.

It is now generally known that the British Iron and Steel Institute have accepted the invitation of the American Institute of Mining Engineers to visit this country in 1874, and hold one of their regular meetings in Philadelphia. The August meeting of the British Institute was held in Liege, Belgium, and before adjourning the question of accepting the invitation of the American Institute of Mining Engineers was taken up and favorably considered, as will be seen from the account of the first and second days' proceedings, published elsewhere. The meeting will probably take place in October of next year, at Philadelphia, and as ample time will thus be had for any necessary preparations, it may be confidently predicted that the British Institute will have a reception which will do credit to the society whose invitation they have honored.

Since the receipt of the cable dispatch announcing the action of the British Institute in the matter, there has been some disposition manifested to criticize the action of the associations representing the iron trade of the country, in permitting an association representing more especially the mining profession to carry off the honors of entertaining our English friends on the occasion of their first visit to America. We are not surprised at this, but when the matter is carefully and impartially considered, it will be seen that there is no occasion for any mortification on the part of the iron trade associations. The only thing to regret is that we have, in this country, no association devoted exclusively to the discussion of questions relating especially to the metallurgy of iron and steel, and, consequently, none which is to the iron trade of the United States what the Iron and Steel Institute is to the iron trade of Great Britain. The American Iron and Steel Association is organized for purposes other than the promotion of scientific, metallurgical and technical discussion, and there is nothing within the scope of its aims and efforts to render it either expedient or desirable that it should extend an invitation to our English friends

to visit this country. The same is true of other associations representing the iron interests of the United States. The National Association of Iron Manufacturers, the National Pig Iron Association, the Eastern and Western Iron Manufacturers' Associations, the National Associations of Nail and Stove Manufacturers, are all trade associations, and it is a provision of the constitution of the Iron and Steel Institute that matters pertaining to the trade in iron shall not be considered proper subjects for discussion at its meetings. The American Institute of Mining Engineers is, then, the only American association or society which could, with propriety, extend to the British Institute an invitation to visit the United States, and it is right and proper they should have the honor. We hope, however, that we shall not long be without a society devoting itself especially to the creation of an American literature relating to the metallurgy of iron and steel, to the investigation and discussion of new and improved processes, the spread of information useful to iron masters, and the promotion of scientific inquiry and experiments among those having the management of our blast furnaces, rolling mills, forges and foundries. There is abundant material out of which to form such a society in this country, and we trust the steps now taking to this end will be completely and promptly successful.

But although the iron masters of the United States have had no part in inviting the British Institute to this country, we feel justified in expressing the belief that our friends, the mining engineers, may confidently rely upon a hearty and liberal cooperation with all efforts which may be made to entertain their guests in a manner calculated to impress them with a favorable idea of American hospitality. There are many reasons why such action on the part of the iron and steel trades of the country would be both timely and proper. The British Iron and Steel Institute deserves well at our hands. During the five years of its existence it has accomplished much in the way of disseminating information of great and permanent value to iron masters at home and abroad, encouraging investigation and experiment, promoting a taste for technical discussion, and collecting and publishing practical knowledge which could not be gleaned from books in any language. For all this we owe the Institute a debt of gratitude. Again, it has been chiefly instrumental in promoting the introduction of several American inventions and processes into English iron works; a work which, though immediately benefiting individual Americans, has secured a recognition of American talent and skill which will result in ultimate benefit to the entire nation. For these reasons the American iron trade is under lasting obligations to the British Institute, and the occasion of their visit will be a fitting time in which to give it expression in words and actions. But there are other considerations which render it desirable that the English iron masters should carry home a good opinion of the iron masters of this country. There exists in Great Britain at this time a feeling against this country which is not conducive to the promotion of amicable relations between the two nations. The successful competition of the United States for the iron trade of Canada, South America and the West Indies, and for trade in manufactures of iron with markets England has hitherto monopolized, including some of her own colonies; the maintenance of a judicious, and, to us, beneficial tariff system; the knowledge that we have all the resources at our command wherewith to make iron for the world, and that it is only a question of time when England must withdraw from competition with us—all combine to create a bitter feeling of jealousy and distrust in the minds of British iron masters, as a class. That there are exceptions is shown by the fact that many English iron masters have already sought investment for their surplus capital in our iron and coal lands, doubtless with a view to transferring their business to this country when they can no longer follow it profitably in their own; and nothing would so promote this movement, which is almost without precedent in the history of trade, as a well arranged tour for our English visitors through those sections rich in resources of ores and fuel only partially developed for want of the capital which, so far as mixing and iron making are concerned, no longer finds tempting opportunities for investment in Great Britain. That the Institute will come to us without prejudice, and with some idea, at least, of the wealth of our resources, may be confidently asserted. In his inaugural address, published in our issues of May 15th and 22d, Mr. J. Lowthian Bell, President of the Association, gave bold and fearless expression to the conviction already dawning in the minds of the more intelligent of British iron masters, in the following memorable words:

If, then, we have to apprehend the advent of a powerful rival in the iron trade, it is not, unless new discoveries are made, the Old World of Europe we have to fear, but the immense and undoubted powers possessed by the Western Hemisphere. In

ores of the finest descriptions the resources of the United States are unlimited, while in coal our own wealth is, in comparison, but poverty. In many cases the relative geographical situation of these minerals is not unfavorable; in short, we are apparently the only bar to the production of iron in the New World, that of human hands to manufacture it. The stream of emigrants, however, constantly flowing from this side of the Atlantic would seem to enable our friends on the other to advance at a rate unknown even in this country; for, according to the "Statistical Report of the National Association of Manufacturers" of the United States, no less than 107 furnaces were erected there in 1873, which is equal to an increase of 15 per cent. in 1870. In the matter of skill, everyone who has had the opportunity of inspecting the American iron works concurs in reporting that their development is quite in keeping with the advantages Nature has conferred upon that highly favored country.

A

delegation coming thus in the spirit of friendliness, prepared to see and appreciate the elements of future national greatness in what we shall have to show them, should be received with a hearty welcome, liberally entertained, and sent home with kindly feelings that will find expression in a hundred ways in years to come.

The National Federation of Employers.

As our readers have already been informed, an important movement is now on foot in Great Britain, which merits thoughtful and serious consideration. It is proposed to organize a national association of employers and capitalists, to oppose the organization of labor and defeat the aims and objects of the trade unions. This association, which has already made some progress, is called the National Federation of Employers, and includes in its membership the names of such eminent manufacturers as Sir Titus Salt, Sir John Crossley, Radcliffe & Sons, R. Haworth, Sharp, Stewart & Co., Robert Neil & Son, Joseph Simpson, Jones Bros. & Co., and very nearly all the leading employers of Sheffield, Birmingham, Bolton, Preston, Kidderminster, Oldham, Rochdale, and other manufacturing centers. It is stated that the united capital represented by the Federation already amounts to over a thousand millions of dollars, and the character of the movement is shown by the fact that Sir Joseph Whitworth has accepted the position of president. So far, then, as strength is concerned, the Federation is already quite able to lock horns with the most formidable of the trade unions.

Of the aims and purposes of the Federation we know only so much as its managers have seen fit to make public; but it is reasonable to suppose that they will not advertise its plan of operations for the information of the unions, who must be watching the progress of the new movement with profound alarm. What they say of themselves is, that the objects of the Federation are to promote and maintain such relations between capital and labor as will secure perfect freedom to each, and conduce to the welfare of both—a promise which, practically, means nothing at all. To attain this desirable result, the Federation is to keep one eye on Parliament, to see that no unwise laws are enacted, and the other on the trade unions, to see that they keep within bounds; to collect and disseminate useful information relating to the industries of the country, and endeavor to secure co-operation and unity of purpose in arranging or resisting demands made by trade unions upon employers in trades represented in the Federation, which is to act as a medium of communication between masters and men. Its plan of organization may be briefly described as follows: Local employers' associations are to be formed wherever there are enough employers to effect an organization, and all employers are permitted to join them upon certain prescribed conditions. These local associations may become branches of the National Federation upon payment of an entrance fee of 5 shillings to £100 of the average amount paid weekly by the members as wages, and an annual subscription to the central treasury of the same amount, or rather, of an amount calculated on the same bases of 5 shillings to the £100 disbursed weekly as wages. The National Federation is to be managed by a president, treasurer, and council of from twenty to fifty members, to be elected annually. The council is to meet quarterly, or oftener, at the call of the president; three members of the council, or twelve members of the Federation, have power to call a meeting of the council, and a quorum of the council have power to call a meeting of the Federation at any time.

Obviously, such an association as this has not been formed for the purpose merely of securing fair play for both sides in the contest between labor and capital now waging. If it had been, the trade unions would have been invited to elect a representative of their best men to the National Federation, that both sides might be fairly represented in any debate upon questions affecting their common welfare. As it is, only employers are eligible to membership, and the workingmen may well distrust the sincerity of the promise that their interests will be looked after—at least, in the sense in which they would like to interpret that promise. We may therefore conclude that the Federation is nothing else than an organization of capital against labor, having for its true object the breaking up of the

unions, the defeat of their plans and purposes, the depression of wages and the restoration, so far as may be possible, of the condition of affairs that prevailed before labor found out it had any power to oppose to that of capital which, in England, was employed to oppress it. No other conclusion can be reached from a careful consideration of the facts before us, and we cannot but think that it would have been better in all respects had the Federation declared openly and honestly its objects, if not the means by which it hoped to secure them.

That the British workingmen, by undue exercise of the power secured through organization, have invited organized resistance on the part of employers, must be admitted.

Up to a certain point our sympathies were with the English workingman, but he has, to a great extent, forfeited that sympathy by pursuing a policy at once foolish and impolitic. From an oppressed and submissive servant he has become a tyrant, oppressing alike his master and his fellow workmen. His new found power has been misused, and he has played the part of the matador in the bull ring, rather than that of the hero who dared to oppose the power which sought to keep him from the enjoyment of a just share of the profits of production. Employers, therefore, are not without provocation in this matter, and that they "mean business" is shown by the manner in which they have taken hold of the movement for their own protection. The question arises, however: Is the course they have adopted a wise one, and will it result in benefit to the industrial interests of the country? We think not, but our limited space necessitates that we should reserve our reasons for so thinking until our next issue.

American Merchant Bar for the English Market.

Although there have been many rumors of late of the receipt by American manufacturers of orders for iron to be sent to England, as well as of shipments actually made from this country, it has been difficult and, in some instances, impossible, to obtain specific information respecting such orders and shipments. We are now able to give the facts respecting one English order received, which, whether it be the first or not, is certainly a matter of much interest to the iron trade of both countries. Messrs. Jackson & Chase, of this city, dealers in iron and steel, have received an order for one hundred tons of round and square merchant bar iron, ordinary specifications, of good quality. This order is not received from a consumer, but from an iron dealer of Liverpool, who buys to sell again. The terms upon which the order was accepted are private, but we are able to state that, while the sellers are satisfied with the price received, the buyer will be able to take the iron to England and sell it profitably in competition with merchant bar of English make. It is a *bona fide* sale of iron for export, not a consignment, and the only possible reason which the buyer could have had for purchasing was the opportunity afforded to make money by the transaction. These facts have not come to us at second hand. We have them direct, and our authority is the firm by whom the order was received and accepted.

Of the significance of such a transaction we need speak but briefly. No one should conclude from the facts above stated that we are about to export largely of merchant bar, or any other kind of iron, to England, but, in connection with the statements made by our intelligent and trustworthy correspondent in Sheffield, whose letter will be found on another page of this issue, they show with startling clearness the condition of the British iron trade at the present time. That such a condition of affairs can long prevail we do not believe, but the causes which have brought it about are not temporary in their nature or operations, and England need not expect that she will ever again be in a position to compete with the world, as heretofore, for the lion's share of its iron trade. America has entered the field, and her strong hand has grasped the iron scepter which has so long been the symbol of England's commercial sovereignty.

Sage Opinions Concerning the Future of Iron.

Our neighbors, the *Tribune* and the *Times*, gave their respective readers on Tuesday last, articles on the condition and prospects of the iron trade at home and abroad, which cannot be said to be very important contributions to the public knowledge on this important subject. The *Times* correspondent—who we suspect is the individual who startled us last winter by asserting that the furnaces of Pennsylvania were making more pig iron than all Europe together—shows his ignorance of the subject in various ways, especially in the following paragraph:

Mr. Jones, of the firm of Jones & Laughlin, a firm employing about 2500 men, and having a business which uses a capital of some \$3,000,000, * * *

likely to import more iron from than she exported to Europe. In the next ten years—much as he wished it might be otherwise. But this very same gentleman is an advocate for retaining the tariff on imported iron, and so, naturally, believes that he asserts. I feel inclined to quote against him the passage which Shakespeare puts into the mouth of the dying king, when he sees Prince Henry trying on the crown, thinking his father to be dead:

" Thy wish was father, Harry, to the thought."

That the writer should have discovered any inconsistency between his belief that we should import largely during the next ten years and a desire to see the tariff maintained, indicates the peculiarity of the mental processes by which his opinions are formed.

The *Tribune* contributor shows his knowledge of the subject by the following presentation of the reasons for the present depressed condition of the iron trade:

The reduced demand for railroad iron in the West and South has brought Western iron masters into the Eastern market, and their cheap competition with the Eastern manufacturers, together with the constantly increasing quantity of ore obtained with the opening of new mines, beside the effect of stringencies in the money market, have lowered the price of American iron so far as to leave little or no profit for the rolling mills and other iron manufacturers. The expense of getting iron to market by the railroads still makes money, but the manufacturers have been forced to try to open new markets, have invaded Canada, where American iron was never before sold, and have even sent some to England itself.

The Western iron masters will, doubtless, be pleased to learn that the abundance and cheapness of ores are among the causes contributing to the present dullness. But the writer, evidently distrusting his own knowledge, has interviewed a number of gentlemen more or less prominently connected with the iron trade, and gives their opinions in place of his own. This was the part of wisdom, it must be admitted, but we cannot but think the gentlemen interviewed would have done well to have given the interviewer their opinions in writing. This business of reporting conversations from memory often leads to the publication of very foolish statements. There is, of course, no possible objection to newspaper discussion of the state of the iron trade, for it is certainly a very interesting subject just now, but we would respectfully suggest to the conductors of our daily newspapers that it would be better to obtain their information in the form of communications from responsible and well-informed sources, than to get it second hand through the medium of reporters, whose memory cannot always be trusted in reporting conversations upon a subject of which they know nothing, and which cannot be learned in an hour or a day.

The British Iron and Steel Institute at Liege.

On the 18th of August, ult., the British Iron and Steel Institute assembled at Liege, Belgium, for their semi-annual meeting. The following communications, sent us by our English correspondent, describe the proceedings of the first and second days:

LIEGE, Monday, Aug. 18.—To-day, a little afternoon, the invading army which has been enlisted in the iron-working districts of England, Scotland, and Wales, made its triumphal entry into the city of Liege. At the railway there were plenty of Englishmen, and fraternizing took the form of musical cheering on the part of the English in the carriage and the Belgians on the platform. There was also a great deal of noise produced by a long-continued *fue de joie*, aided by the band of the city pompers, who played "God Save the Queen." Then the visitors were conducted to the private carriages, which the gentlemen of the city and the neighborhood had placed at their disposal, and were driven through a beautiful avenue of trees up to the *Flux de Theatre*, three-quarters of an hour afterward. A guard of honor, stationed upon the outside stone staircase which leads to the principal entrance to the *Hôtel de Ville*, presented arms as the members of the Institute who had removed their travel stains, passed into the entrance hall. The worthy burgomaster of Liege, standing in the middle of the beautifully decorated *Salle des Muses*, received the visitors most cordially. Mr. J. Lowthian Bell, the president of the Institute, Mr. Alexander Brogden, M. P., and several other of the leading members, were personally introduced to the burgomaster, who then proceeded to deliver, from a tribunal near the center of the room, a most animated address (in French), in the course of which he made special reference to the connection between the development of such industries as those which are particularly associated with the work of the Institute, and the development of social and individual liberty. The president of the Institute replied, evidently much to the delight of his Belgian auditors, in French, and paid the burgomaster a happy compliment as the representative of the system of local self-government which, in such countries as England and Belgium, had done so much to uphold liberty.

vail in the manufacturing districts of Belgium, France, and Germany. This naturally led Mr. Bell into the question of how far the mode of living of the artisan classes is affected by the prevailing conditions of the surrounding population. Upon this point, after giving some statistics to show that when "living is cheap wages are low," he said: "It might at first sight seem immaterial what a man's wages were, provided the cost of the necessities of life corresponded with the rate of pay. It is, however, a remarkable fact that, as a rule, however low-priced provisions may be in these cheap countries, labor is paid for on such a scale as to compel the greater portion of the working population to subsist on very miserable fare." This general question formed the subject of the president's address. He arrived at the conclusion that the supremacy hitherto enjoyed by Great Britain has not been the consequence of any faculty which she possesses over other countries for getting a given amount of work done for a less sum than it would be necessary to pay in Belgium, France, or Germany. On the contrary, he holds that in this respect we actually stand in less favorable position than those countries. The solution of the problem, Mr. Bell alleges, the simple fact that England has possessed "what hitherto may have been regarded as unlimited powers of production in respect to her fuel." How far this condition of success may be affected by the recent enormous increase in the price of coal, Mr. Bell declines to hazard an opinion, but goes on to suggest that "most instructive lessons in the all-important science of political economy are involved in the experience of the last year or two, and that members of the Institute had better apply their minds to finding out exactly what these lessons are." Better advice could not be given by anyone in Mr. Bell's position, especially as he has supplied in his address plenty of material for cogitation. The address of the president was replied to by M. L. Trasianster, the president of the committee of reception. Some business announcements were made, including one which seemed to give great satisfaction to the assembled Britons, and which referred to the proffered hospitality of the King of Belgium, of which I have already informed you, the *seance* ended, to be resumed for the reading of papers and discussion.

TUESDAY.—The brilliancy of the fete which was given last evening in the Zoological Gardens was marred by the unfavorable state of the weather. The display of fireworks was postponed and will be held instead to-morrow on the Quai de St. Barbe, opposite the building where the grand banquet is to be given. This morning the members of the Institute held a second meeting, and several papers were read. It was announced that the members were invited to hold the meeting next year in the United States. At the close of the sitting a visit was paid to the public buildings of Liege, and the members will be received this evening separately by different leading manufacturers. Great preparations are now being made for a serenade which is to be given to-night on the *Plas du Theatre*. The Square will be brilliantly illuminated.

A Market for American Manufacturers in Great Britain.

To the Editor of *The Iron Age*: Two months of the present year spent in various parts of England, from Yorkshire to Devonshire, and from Lancashire to Kent, with no inconsiderable amount of observation, have served to satisfy me that there are a vast number of implements, appliances, and products of our diversified industries which are infinitely superior, in proportion to their prices, to anything which the English make for the same uses. Further, that in the very home of our old industrial rival there is to-day a vast market, which invites us to take possession of it, and which can be taken and held by means of a sufficient concentration of capital, a knowledge of English trade, and a good deal of vigorous and judicious advertising—the management of the latter being, as I think, one of the few business qualities in which the English surpass us.

By entering this field, not only may we make large sales for English consumption, but, once fairly established upon the spot, quantities can be sold for export to the various nooks and corners of the world wherewith Great Britain trades, but which cannot be shipped from here for a want of the shipping and trade facilities which are alone possessed by that country.

The insignificant amount of our exports of manufactured goods, compared with that of Great Britain, is by no means alone attributable to the superiority or cheapness of British manufactures as compared with ours, but largely to the following causes:

1st. The aggressive nature of British foreign trade for centuries past, the control of foreign markets, and the facilities for reaching them, which are superior to those of any other people.

2d. The limited home market of Great Britain, compared with our own, owing to the poverty of the great mass of her people preventing them from becoming large consumers, and rendering it absolutely necessary to seek markets abroad for a great part of the products of her extensive industries.

3d. The difficulty in England of finding remunerative employment at home for intelligent and enterprising men without capital, there thus always being a large body of such men who are quite ready to go into exile for the sake of employment, and who thereby assist in carrying out the aggressive system of English foreign trade.

In my humble opinion the time has arrived for American hardware, edge tools, stoves, &c., &c., to be largely sold in the markets of Great Britain for home consumption and for export, and I would suggest that ten, fifteen or even twenty of our most extensive and wealthy manu-

facturers of such articles, in conjunction with Englishmen of capital who understand the trade, establish in England a company of, say, £100,000, or more capital under the English limited liability laws, which are extremely liberal in their provisions, and let this company enter upon the sale of a full line of American goods of these descriptions. Depend upon it, with judicious management, a business of many hundreds of thousands of pounds per annum may be built up in the course of a few years. In stoves alone an immense business may, in the immediate future, be done, the high price of coal rendering economy in its use at once necessary, and requiring the substitution of stoves for the open grates, long so popular in England, and which, according to a high English authority, "probably deliver to our apartments an amount of heat which may be represented as one-twentieth of the total heat capable of being extracted from the fuel they consume." In the past great prejudice has existed among our cousins across the water against stoves, but this prejudice must give way to the necessities of the times, and here we may reap a large and immediate harvest.

As an indication of what it is possible to do in this field with enterprise and management, I would instance a valuable pharmaceutical preparation emanating from New York, and which, by means of agencies in Liverpool, London and elsewhere, and liberal and judicious advertising, has been pushed into general use in every nook and corner of England. I never failed on inquiry to find it in any drug store there, either metropolitan or provincial. Again, American organs, harmoniums, etc., are being largely introduced there, and indeed the prefix "American" to almost any article is considered a recommendation for it.

In conclusion permit me to beg most earnestly that the parties interested will for themselves examine into this important subject, and I believe that their own judgment will confirm that of

Very truly yours,

HENRY CAREY BAIRD.

PHILADELPHIA, August 18, 1873.

Scientific and Technical Notes.

A series of interesting
SUBMARINE BLASTING OPERATIONS IN THE
SCHUYLKILL RIVER

are now in progress, having for their object the removal of rocks which impede navigation. Two months ago work was commenced at a point where 800 cubic yards of rock had to be removed so as to make the channel 10 feet deep at low tide. Three kinds of rock were found—one of soft mica, another of feldspar and quartz, very hard, and the third of a hard, dark sandstone. To remove these rocks, holes 3½ to 4 inches in diameter, and 5 or 6 feet apart, were bored to the required depth, which varied, of course, with the size of the obstruction. Burleigh's steam drill was used. This drill, which in a compact form comprises an engine and the drill proper, is mounted on a tripod with telescopic legs, to conform to the irregularities in the bottom of the river. Steam is supplied through a flexible hose from a boiler on the workmen's scow, and the drill is made to give from 150 to 200 blows per minute. The drills are from 10 to 18 feet in length, rose bitted, with four lips of cast steel from 3½ to 4 inches in diameter. The drill is connected directly with the piston of the cylinder, and is given two motions, perpendicular and rotary. It is self-feeding, and as the work proceeds, the cylinder of the engine follows the drill, thus allowing a play of about 3 feet with each one of the drills of different lengths. The holes are bored from 3 to 11 feet deep, and with this machine about 15 feet are bored each day. Water is pumped into the hole made by the drill during the operation to wash out the sediment, and, when completed, the holes are plugged up by a diver, a rope connecting all the plugs and guiding him to the several holes. The diver is dressed in an India-rubber suit, with copper helmet and breast-plate, lead shoes, and heavy weights are fastened to his side. The shoes have leaden soles, and weigh 60 pounds. The helmet weighs 50 pounds, and the suit about 40 pounds, so that the diver carries 380 pounds into the water. Few men can bear the load in ascending and descending, but in the water the weight is not felt, and the diver can work at the bottom of the river for many hours without extraordinary fatigue. The copper helmet is very large, and has three glass windows in it that look like the port holes of a ship. When these are closed the diver's only supply of air is from an India-rubber tube into which air is continuously pumped by two men. The air circulates about the man's head and escapes at the back, but any stoppage of the supply would result in almost instant death. The diver first sets the drill in position, then returns and plugs up the hole, again returns, withdraws the plugs, and puts in place thereof dual cartridges, and after the blast has been made, again descends to put chains around the heavier rocks, that they may be lifted out of the river. The advantage of using dual instead of powder is that, as a general rule, it reduces the rock to powder, or breaks them up into such small pieces that they can be removed by means of the dredger. The dual cartridges used are from 4 to 8 inches in length, and sometimes several are used in one hole. They are fired off by means of an electrical battery, to which is attached an insulated line terminating in metallic fuses fastened inside the cartridges.

Prof. Scheerer, of Freiberg, prescribes following as the best and simplest process of ELIMINATING PHOSPHORUS FROM CAST IRON, and which, it is claimed, yields superior bar iron from phosphorus-free cast iron, at practical, no increase of cost. Chloride of calcium and common salt fused together, in about equal proportions, are intimately mixed with the molten iron in the puddling furnace, either by adding gradually in two pound water-tight paper packages, or placing the whole quantity required upon the bed of the puddling furnace at first, and, in either case, very thoroughly working it with the iron. The puddling process is generally so much shortened that the consequent diminution of the waste of iron almost offsets the cost of the material added. The quantity of the mixed chlorides required is about three times that of the phosphorus present in the cast iron. The presence of other chlorides, as of manganese, iron, and magnesium, interferes with the process, and renders a large excess of chloride of calcium necessary.

The Managers of the 43d Exhibition of the American Institute, of the City of New York, beg to announce, that the Exhibition Buildings on 2d and 3d Avenues and 63d and 64th Streets, will be open for the reception of heavy Machinery August 18th and for other articles, September 1st 1873. The Exhibition will be formally opened Sept. 10th.

For particulars, address "General Superintendent, American Institute, New York."

Special Notices.

OFFICE OF
WALTER A. WOOD MOWING &
Reaping Machine Co.,

HOOSIC FALLS, N. Y., August 22, 1873.

To Our Agents and Patrons:

We have been asked by a number of our agents and friends to give them a true statement of the facts connected with Award of Prizes on Mowers and Reapers at the VIENNA EXPOSITION.

In answer we would say, that the GRAND DIPLOMA OF HONOR, the highest honor at the gift of the Exposition, has been awarded to WALTER A. WOOD. He was the ONLY manufacturer of Mowing and Reaping Machines who received the DIPLOMA OF HONOR, and only FIVE Diplomas were awarded to individual citizens of the United States.

This award was made after severe tests in THE FIELD. Some of our competitors were awarded medals of "MERIT" and "PROGRESS," but no one of them the GRAND AWARD.

Our victory at the Paris Exposition in 1867 is again repeated at Vienna in 1873, and we congratulate ourselves and our patrons on this brilliant success at these great International Expositions.

In our own country our success has been equally as complete, as indicated by the largely increasing demand and sales of the past harvest.

Very truly yours,

WALTER A. WOOD, President.

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A first-class New York city iron house who would like to extend their business in supplying customers with Homogeneous Steel Boiler Plates, now so successfully taking the place of the best brands of Charcoal Hammered Iron; Steel Bars of the same stock, in round, square, rectangular, and angle forms; Steel Foundry Plates, sole representative in this market of one of the largest and most successful Steel Works in the country; Carbon.

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Translations and Condensations.

The undersigned, commercial Editor of *El Cronista* the Spanish Government paper in this city, and Foreign Editor and Translator of the *Daily Bulletin*, has made it a specialty for years past to translate material, particularly of a technical character, to English, Spanish, French, German, Italian, and Portuguese, and to send the same to American manufacturers and others, and begin to be recommended to the iron masters and trade in that capacity.

C. KIRCHHOFF, Box 2806, Post Office.

Latest Publications translated by C. KIRCHHOFF.
"German Imperial Circular Instructions." "Cuba may be considered as officially endorsed by the government of Germany and Spain."

"The McHale Steel Co." Chester, Delaware Co., Pa.

R. T. HAZELL, AUCTIONEER.

By R. T. Hazell & Co.,

Store No. 118 Chambers Street.

Our REGULAR SALES of HARDWARE, CUTLERY, FANCY GOODS, &c., will be held on TUESDAYS and FRIDAYS throughout the season.

CASH ADVANCES made on CONSIGNMENTS without additional charge.

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desirous of introducing their goods to the British and Continental Markets, are advised to insert advertisements in the newspaper "IRON," published every Saturday, at 99 Cannon Street, London, E. C.

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F. T. HAZELL, AUCTIONEER.

23 & 25 Commercial Street, Boston.

BOSTON, Nov. 30, 1872.

For Sale.

The Managers of the 43d Exhibition of the American Institute, of the City of New York, beg to announce, that the Exhibition Buildings on 2d and 3d Avenues and 63d and 64th Streets, will be open for the reception of heavy Machinery August 18th and for other articles, September 1st 1873. The Exhibition will be formally opened Sept. 10th.

For particulars, address "General Superintendent, American Institute, New York."

For Inventors and Manufacturers

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Trade Report.

Office of THE IRON AGE.
WEDNESDAY EVENING, Sept. 3, 1873.

The past week has been characterized by greater activity in the money market and a stiffening in rates, which, on call loans, have advanced to 4 @ 7 per cent. For mercantile paper the rates are 7 per cent. for short date and 8 @ 10 per cent. for four and six months' acceptances.

The operations of the gold clique have caused a further advance in the premium during the week, but it is now generally believed that their threats of precipitating another "Black Friday" panic have been made chiefly to enable them to unload. To carry out their plan they have made cash gold as scarce as possible, and borrowers have been compelled to pay for its use. The following table shows the daily range of the premium:

	Highest.	Lowest.
Thursday	115%	115%
Friday	116%	115%
Saturday	115%	115%
Monday	116%	115%
Tuesday	116%	115%
Wednesday	116%	115%

The Treasury programme for September, published on Monday, provides for the sale of \$6,000,000 gold, \$1,500,000 every Thursday, and the purchase of \$500,000 five-twentieths for the sinking fund on Wednesday, the 17th.

The stock market has been inactive, and but few transactions reported. The principal dealings have been in Pacific Mail, Western Union, Erie, Lake Shore, Union Pacific and Ohio & Mississippi. The highest and lowest of to-day's quotations are given below.

The bond market has been inactive, but prices are firm and have advanced with gold. The closing quotations are given below.

The bank statement shows a reduction of \$2,852,100 in the total reserves, and of \$7,233,500 in total liabilities. The decrease in specie in the face of the sale of \$1,500,000 and the payment of September interest is explained by the customs payments into the Treasury and the transfers by members of the Syndicate of a part of the Geneva award from the banks to the Treasury. The banks now hold in lawful money \$5,904,450 above what would be a 25 per cent. reserve, against \$6,950,175 last week. The following is a comparison of the averages of the past two weeks:

	Aug. 26.	Aug. 29.	Differences.
Loans....	\$28,151,200	\$28,865,000 Dec. \$1,694,800	
Specie....	25,141,200	23,095,200 Dec. 2,049,000	
Clearance....	27,214,400	27,981,900 Inc. 67,593	
Deposits....	287,691,300	290,390,000 Dec. 7,301,000	
Leg. Tens....	45,532,400	44,739,300 Dec. 806,100	

The following tables show the foreign trade movements for the week:

	IMPORTS.	1871.	1872.	1873.
Tot. for week....	\$8,771,076	\$11,092,938	\$18,463,334	
Prev. reported....	253,447,738	388,972,269	287,566,186	

Since Jan. 1....\$62,218,874 \$300,065,907 \$276,061,920

Included in the imports of general merchandise for the week are:

	Quant. Value.
Anvils.....	73 \$1,191
Brass goods.....	80 4,123
Bismuth.....	1 465
Bronzes.....	37 5,560
Chains and anchors.....	85 4,927
Copper.....	1,387
Cutlery.....	167 71,149
Gum fixtures.....	75
Guns.....	137 14,451
Hammers.....	14 1,770
Iron, pig, tons.....	1,467 50,832
Iron, sheet, tons.....	261 47,918
R. R. bars.....	7,808 159,755
Iron cotton tics.....	527 1,888
Iron ore, tons.....	1,450 7,146
Iron, other, tons.....	1,017 54,819
Lead, pigs.....	2,677 17,586
Metal goods.....	201 20,571
Nails.....	51 663
Needles.....	27 12,949
Old metal.....	5 5,384
Saddlery.....	5 1,060
Steel.....	3,142 37,270
Spelter.....	110,500 6,224
Silverware.....	3 211
Tin boxes.....	28,043 264,272
Tin 2249 slabs.....	lbs. 113,200 35,753
Wire.....	369 7,173
Zinc.....	24,223 1,664

EXPORTS, EXCLUSIVE OF SPECIE

	1871.	1872.	1873.
For the week....	\$3,955,745	\$4,695,445	\$5,420,644
Prev. reported....	149,973,618	141,491,440	184,508,583

Since Jan. 1....\$153,930,780 \$147,156,855 \$190,229,297

EXPORTS OF SPECIE.

	Sept. 1, 1873.
Total for the week.....	\$39,284,636

The government bond market closed steady.

We quote:

	Bid.	Asked.
U. S. Currency 6s.....	113%	113%
U. S. 6s, 1881, reg.....	117	117%
U. S. 6s, 1881, c.	119%	119%
U. S. 6s, 1881, reg, May and Nov.	119%	—
U. S. 6s, 1881, c.	119%	—
U. S. 5-30 1863, c.	117	117%
U. S. 5-30 1863, c.	118%	118%
U. S. 1867, reg, Jan. and July....	116%	117
U. S. 1867, c.	116%	117
U. S. 1867, reg, c.	118%	118%
U. S. 1868,	117	118
U. S. 10-30 reg.....	113	113%
U. S. 10-30 cou.....	113	113%
U. S. 10-30 cou.....	114%	114%

The following were the highest and lowest prices of stocks to-day:

	Highest.	Lowest.
N. Y. Cen. & Hudson Consolidated.....	105%	104%
Lake Shore.....	93	92%
Rock Island.....	10%	108%
Wabash.....	70%	69
Western Union Telegraph.....	92%	91%
Panama.....	11%	117
Pacific Mail.....	14%	14%
Frisco.....	59%	89%
Ohio & Mississippi.....	39%	38%
Union Pacific.....	26%	26%
C. C. & Ind. Central.....	31	30%
Atlantic & Pacific Preferred.....	26	26

GENERAL HARDWARE.

The daily papers last Thursday had a cable dispatch, giving a synopsis of a leading article in the London Times, the burden of which was that England's supremacy in the manufacture of iron was passing away. This dispatch has been the text of much comment in American newspapers, although it merely gave expression, more forcibly, perhaps, than usual, to what has been for months the feeling of intelligent observers on both sides of the ocean. The Times itself, but a short time ago, spoke as follows regarding the progress of our American Hardware and Iron industries, both in our own and foreign markets:

"Not a little interest and apprehension have been excited in the Hardware district, of which Birmingham is the center, by advices lately to hand from New York respecting the wonderful development of the Iron and Hardware industries of the United States. The accuracy of these advices is, indeed, to some extent confirmed by the serious diminution of orders for certain classes of Hardware, the manufacturers of which have hitherto found a large American market, their principal buyers. Nor can we appear that our rivals in the States are content with satisfying the requirements of their own market, for their productions are already supplanting English ones in Canada, and to some extent in Australia and New Zealand."

In order that this might not be thought an exaggerated view of the case, the Times quoted a well-informed correspondent of the Birmingham Post, writing from New York to this effect:

"On one point the hardware merchants of New York and I agree that they are the English hardware in the United States buyers. In some few special articles, such as pliers, etc., the Germans will probably always be able to undersell all competitors; some English manufacturers of long-established repute, such as Rodgers' cutlery, will also continue to be in demand, but for the rest foreign-made hardware will soon be unknown in this market, unless some unexpected turn of affairs changes for a while the course of trade. And not only is this the case at present, but the American manufacturers are making no effort to capture their own market, having, however, increased its exports to the British Australian colonies. Indeed, it is a very common boast that in a very short time the superiority of Yankee skill and ingenuity will force a market in England itself for many articles of American hardware; that Yankee cutlery will appear on English dinner tables, and Yankee saws, angars and chisels be preferred by the carpenters of Birmingham and Sheffield."

To this the Times adds:

"These statements are to some extent corroborated by the advices now being received by the merchants in Birmingham and Wolverhampton. There can be no doubt that the American manufacturers are not to be beaten in the opportunity afforded by the present course of events in the English labor market. For some years the American manufacturers had to contend with the disadvantage of dear labor; but this very circumstance has, in the long run, proved a benefit to them, seeing that it has enforced the application of labor-saving machinery on a much larger scale than has been attempted in this country. The superiority of English iron casting, however, has been acknowledged, and in the earlier years of hardware manufacture in the States, the dearness of labor was largely compensated by the substitution of cast for wrought iron, in almost all classes of produce. This advantage was, however, obtained at the expense of the quality of the goods for strength and endurance, and the necessity of increased mechanical appliances for the saving of labor became apparent in some years after the leading manufacturers of the States. The wonderful system of labor-saving machinery now existing is the result. Rail-way fastenings, door locks, spring bars, curvy combs, tins, wares, and some descriptions of edge tools are among the classes of produce in which American competition is beginning to be seriously felt in Birmingham and the South Staffordshire district. Last year the produce of iron rails in the United States nearly 1,000,000 tons, and the English, French, German, and American manufacturers are all producing nearly one-half. Other descriptions of finished iron are also being produced in large and rapid increasing quantities, and at the present rate of progress the shipment of iron from England across the Atlantic will soon become a thing of the past."

As confirmation of this, to some extent, the following sentence from Macomber, Bigelow & Dowse's Boston report, in this issue of *The Iron Age*, is interesting:

"Exports of Hardware to South America and Sandwich Islands, also to the Provinces, being beyond the usual demand, show conclusively that we can compete advantageously with England. We have only to make American goods known more to create an extensive business in foreign markets."

Trade is active, but the amount of goods sold does not seem so large as it was a few days ago. The demand now coming from a smaller class of buyers. Present indications point to a moderate and healthful fall trade. Every one seems careful not to buy more goods than he needs. The feeling prevails that while prices are not likely to decline materially, there is little likelihood of serious advances, so that there is no temptation to speculate.

In foreign Hardware, trade is fairly active, although business has fallen off as compared with the previous week. We notice a brisk demand from the interior for Peter Wright's Anvils, the stocks of which are being rapidly reduced, and holders are consequently firm in their views at our quotations. There is no change to notice in prices. Some goods have been shaded through the anxiety of weak holders to make sales, while Coil Chain and Traces are more firmly held at the figures quoted, owing to recent advances. A cable despatch to Alfred Field & Co., received since our last issue, gives notice of a further advance of a half-penny on Traces, 6½% to 10-20 being now quoted in Birmingham at 1 4/5%.

We omit our usual quotation of German Hanger and Coil Chain, as any figure we might quote, under existing circumstances, would at best be nominal. 20 @ 25 per cent. discount is generally considered the fair market value of these goods, but it is proper to state that these figures can be shaded considerably with little difficulty. Butcher's Files are in fair demand, and holders are firm at 55-50 to £, gold. Goodlad's Files, of which there is a good stock in this market, are offered at \$4 to £, gold.

There is no change to report in the condition of the Nail market. The Eastern Mills resumed operations on Monday last, and the demand, although not noticeably brisk, continues fair. Although it is freely asserted that the manufacturers are losing money on sales made on a basis of \$4-50 net, for 10d, still there is no difficulty in placing orders for small lots at that figure, but we hear of no lower price for larger lots; on the contrary, manufacturers as a rule are reluctant to book large orders, and decline with firmness the acceptance of contracts for future delivery at these rates.

Trade in

THE ARCTIC FREEZER.

SIMPLEST.



BEST.

Send for Price List.

E. S. & J. TORREY,
166 Fulton Street, New York,

QUICKEST.

J. D. FARRINGTON, Jr.,
38 Murray Street, New York.
MANUFACTURER OF

Japanned, Plain and Stamped Tin Ware,

THE PATENT SELF-RIGHTING
CUSPADORE

Is superseding all others. Being made of METAL it will not break, and as the lower part is
CAST-IRON, will not corrode as quickly as other articles composed of sheet metal for the same purpose, and if upset, it rights itself immediately.

J. D. FARRINGTON, Jr.,
SOLE MANUFACTURER.

Price List of Self-Righting Cuspadores:

Class A, Seven Patterns	-	-	-	\$15.00 per dozen.
" B, Eight "	-	-	18.00	"
" C, Eight "	-	-	21.00	"
" D, Eleven "	-	-	24.00	"
Nickel Plated, No. 1	-	-	48.00	"
" " No. 2 (small)	-	-	42.00	"

THE CORRUGATED STOVE PIPE ELBOW,

Strong, Durable,

No Soot,

Cheap.

Made of One Piece

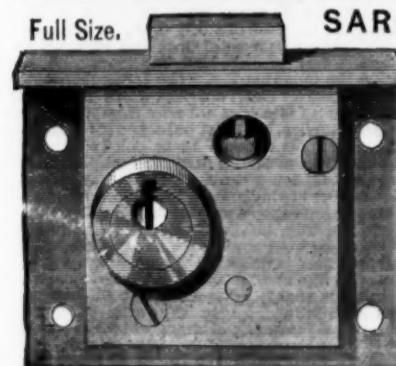
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MANUFACTURED BY

SELLIW ELBOW CO.,

48 Cliff Street, NEW YORK. 27 North Canal Street, CHICAGO.

Full Size.



SARGENT & GREENLEAF'S

Celebrated

UNPICKABLE LOCKS.
Drawer, Trunk,
HOUSE AND STORE DOOR LOCKS,
PAD LOCKS,
Night Latches, Etc.,
WITH FLAT GERMAN SILVER KEYS.
Combination Bank and Safe Locks.
Also the

Patent Adjustable Elbow.



For Stove, Furnace, Conductor, and all other Sheet Metal Pipes, With Universal Adjustable Joints.

Can be changed at will to any desired angle. Its advantages over all other Elbows are at once apparent.

For Beauty, Strength and Durability it is Unequalled.

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Send for Catalogue and Price Lists.

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New York Fire Brick &
STATEN ISLAND
CLAY RETORT WORKS,
Established 1845.
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The largest stock of Fire Brick of all shapes and sizes on hand, and made to order at short notice.

Cupola Brick, for McKenzie Patent, and others. Fire Mortar, Ground Brick, Clay and Sand. Superior Kaolin for Rolling Mills and Foundries. Stone Ware and other Fire Clay and Sand, from my own mines at New Jersey and Staten Island, by the cargo or otherwise.

Philadelphia Fire Brick
AND
Clay Retort Works,
AND KENSINGTON FIRE BRICK WORKS.

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PHILIP NEWKUMET,
Successors to JOHN NEWKUMET, Proprietor manufactures 9-inch Fire Bricks, Tiles, and Blocks, for Rolling Mills, Blast Furnaces, Foundries, Gas Works, Lime Kilns, Glass Houses, &c., &c.
Articles of every description made to order at short notice, and in a very superior manner.

"CLAY RETORTS FOR SUGAR HOUSES."

A. HALL & SONS, Perth Amboy, N. J.
ESTABLISHED 1846.

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ESTABLISHED 1866.

FIRE BRICK
of reliable quality for all purposes, manufactured of the best New Jersey Fire Clay. Also, MINERAL KNOBS, ROCKINGHAM WARE, Fire Clay, Fire Sand, Kaolin and Ground Fire Brick.

BLACK LEAD
CRUCIBLES.
Manufactured by
ADAM NEWKUMET,
1537 & 1539 N. Front St., Phila., Pa.,
For Steel, Brass, Nickel, Copper, Bronze, &c.
Equal to any in the market, and all guaranteed.

Especially keeping a full stock of all sizes on hand, and being confident of giving entire satisfaction, we respectfully ask consumers to give us a trial.

Watson Fire Brick Manufactory,
ESTABLISHED 1836.

JOHN R. WATSON, Perth Amboy New Jersey,
Manufacturer of

FIRE BRICK,
For Rolling Mills, Blast Furnaces, Foundries,
Gas Works, Lime Kilns, Tanneries, Boiler
and Grate Setting, Glass Works, &c.
FIRE CLAYS, FIRE SAND, AND KAOLIN FOR SALE.

Salamander & Albany Fire Brick Works

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Manufacturers of FIRE BRICK of every shape
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Blast Furnaces, Glass Works, Stove, Range and Heater
Linings; Fire Clays, and Fire Clay for Fire Cement,
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Little Giant Pipe Machine, Fire and Red Brick
Presses, Clay Wheels, Tile Machines, Stampers,
Grinding Pans, Brick Yards fitted out for running
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Mechanical work a Specialty.

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Letter "B" Geared Counter Coffee
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Stands nearly 2½ feet high. Is highly finished, colors
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ferent styles and sizes.

Send for catalogue. Manufactured exclusively by

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Four Sizes. Coal or Wood
Shaking and Dumping Grate,
and Swing Top.

Manufacturers of the renowned Cooking Stoves, FASHION, for wood, and MONITOR, for coal and wood, and the greatest variety of Coal and Wood Heating and Cooking Stoves. A large stock constantly on hand, and all orders filled promptly. (Send for Catalogue and Price List.)

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SWISS METAL.

Very Pretty.

half the size of an ordinary Hand Bell can be heard further, and the ear.

the full size of the made either Polished, Plated.

Price List.

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NEW BRITAIN,



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Hods.

STAMPED CORRUGATED RIVETED BOTTOM IN SIX STYLES.

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Manufacturers of

Galvanized and Japanned Sheet Iron Goods and Tin Ware, Fry Pans, Broilers, Ash Cans, Garbage Buckets, Chamber Pails, Tea Kettles, Wash Boilers, Water Pails, Well Buckets, Toilet Ware, &c., &c. Exclusive manufacturers of the Patent Combined Chamber and Commode Pail. Stamped and Planished Ware.

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SOLID BOX VISES.

With or without Convex and Concave Washers.

Jackscrews, Braces, Coffe Mills, Turning Lathes; Clamp Heads and Screws; Parallel Bench Vises, Sash Pulleys, Ho House Pulleys, Composition Cocks, Bench Screws, Vise Screws Gridirons, Drill Stocks and Bows, Box Chisels, Rivets, Sheaves, Block Pins, Composition Roller and Iron Bushings, Riggers' Screws, Caulkers' Tools, Pump Chambers, Belaying Pins, Marlin Spikes, Malleable Iron Castings, and General Hardware.

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Manufacturers of all kinds of
HAMMERS AND SLEDGES AND CONTRACTORS' TOOLS,
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**Malleable and Light Gray Castings,
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Special attention paid to Jobbing and General Pattern Work.

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Steam Engines, Boilers & Heavy Machinery of all kinds, and Heavy Forgings.

FORD'S PATENT STOVE, for heating Air for Blast Furnaces.

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Castings from Gun Metal, guaranteed 30,000 pounds per square inch.

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The book treats of experience with brigands; nights in opium dens and gambling halls; life in prison; stories of exiles; adventures among Indians; journeys through sewers and catacombs; accidents in mines; pirates and piracy; tortures of the inquisition; wonderful burglaries; underworld of the great cities, etc., etc.

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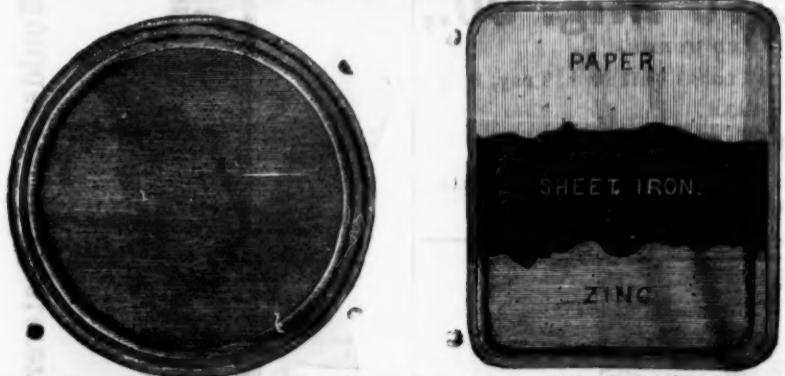
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Brooks' Patent Stove Board.

Letters Patent from the United States and Canada.



This really genuine improvement in Stove Boards is illustrated by the cuts: the round one being a top view of the zinc surface, polished and neatly beaded around the edge, and the oblong one shows the under side, divided of paper, and between that and the zinc a layer of sheet iron, which effectually protects it from being injured by the stove legs, or otherwise; and also stiffens it to lay very flat, and is a necessity to support the ornaments.

The parts are held together by turning the edge of the zinc like a hem around the under side. They are equally desirable for Parlor or Cooking Stoves, are very compact to ship, as cheap as plain zinc, when their durability is considered, and are the most appropriate article in market for their purpose.

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405 Commerce Street, Philadelphia. Sold by FERRY & CO., 56 Beekman St., N.Y.



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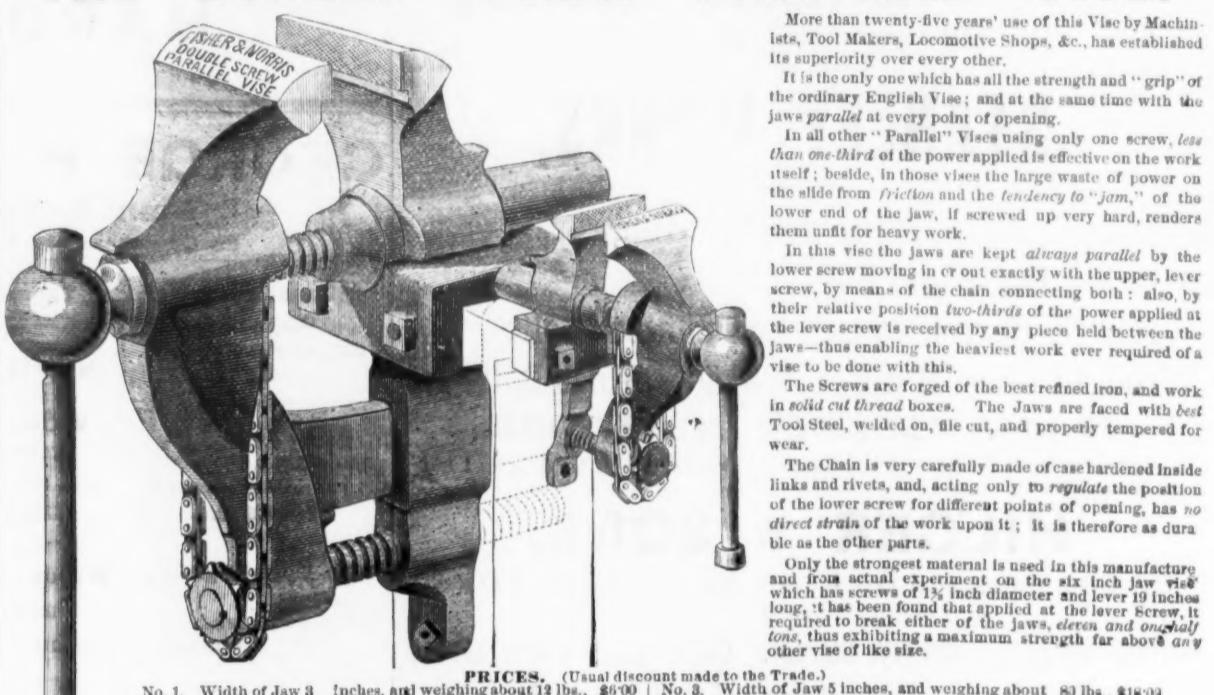
The great popularity of the **BARBER BIT BRACE**, and the firm prices at which they are held, have induced several manufacturers to infringe our patents, and offer an inferior article at less price. As to the infringement, we shall at present only trouble the manufacturers. As to cheaper goods at a lower price, we say to our customers, if you really want them we can make them of any desired quality and price. But up to the present time we have steadily improved our goods and have sold them as low as such goods could be afforded. The actual cost of our braces is at least 20 per cent. more than those which are offered in the market at 5 per cent. less than ours. At present we are able to hold most of our trade, and we shall continue to improve our goods and sell at reasonable rates, while the hardware trade continues to support us in so doing.

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No. 1. Width of Jaw 3 inches, and weighing about 12 lbs., \$6.00 | No. 2. Width of Jaw 4½ inches, and weighing about 50 lbs., \$14.00 | No. 3. Width of Jaw 6 inches, and weighing about 125 lbs., \$24.00

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THESE GOODS ARE SOLD BY OUR AGENTS IN

NEW YORK.—Messrs. Clark, Wilson & Co. RUSSELL & ERWIN MANUFACTURING COMPANY. Messrs. Durrie & Russer.

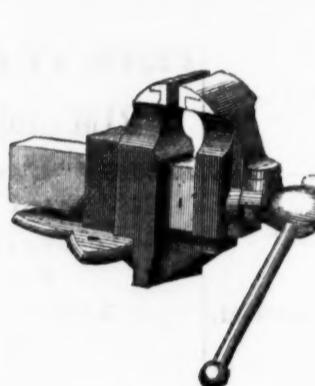
BOSTON.—Messrs. George H. Gray & Danforth. PHILADELPHIA.—Messrs. James C. Hand & Co. BALTIMORE.—Mr. W. H. Cole.

FISHER & NORRIS, Trenton, N.J.

Sole Manufacturers of these Vises, and of the "Engle" Anvils.

HOWARD

PARALLEL BENCH VISE.



Manufactured at the

HOWARD IRON WORKS,

Buffalo, N.Y.

RUSSELL & ERWIN MANUFACTURING CO.,

New York and Philadelphia, Agents.

MINOT & CO., Oliver Street, Boston,

Selling Agents Lowell Wrench Co.'s

TRIPLE ACTING RATCHET DRILL, the Simplest, Cheapest and Best.

MANUFACTURERS OF

HAMMERS,

Sledges,

BLACKSMITHS'

AND

STONE MASON'S

TOOLS,

BUSH HAMMERS,

etc., etc.



AGENTS FOR
Washoe Picks,
Western Files,
Sweet's Crow Bars,
N. Carolina Handles,
Steel Foundry Riddles
Beaver Falls Cutlery
etc., etc.

Send for Price Lists and Discounts.

Hardware.**ROY & COMPANY,**
West Troy, N. Y.,

Manufacturers of

Wrought Iron Butts, Strap and T Hinges,
PLATE AND HOOK HINGES,
Cold Pressed Nuts and Washers, Felloe Clips, &c.
JOHN L. FISHER, Agent, 116 Duane Street, New York.

SPEAR & JACKSON

Sheffield, England,

MANUFACTURERS OF

Saws, Files, Edge Tools and Steel
JOHN L. FISHER. Agent,
116 Duane Street, NEW YORK.

STANLEY WORKS,

MANUFACTURERS OF

Wrought Butts, Strap and T Hinges.
Bronzed Butts and Bolts.
Wrought Barrel, Square and Shutter Bolts.
Wrought Chest Handles, Washers, Flush Bolts, &c.
79 CHAMBERS ST., NEW YORK.
Factory at New Britain, CONNECTICUT.

HILGER & SONS,

87 Chambers and 69 Reade Streets, NEW YORK

MANUFACTURERS AND IMPORTERS OF

German Hardware, Cutlery, Scissors, Coffin Lace, Sheep Shears
Ball Braces, Bright Halter and Coil Chains, &c.

Also, Birmingham and Sheffield Hardware and Chains, Butcher's Files, Edge Tools & Razors, Wostenholm's Razors & Farriers' Knives, John Wilson's Butcher Knives and Steels, Stub's Tapers, Chesterman's Metallic Tapes, Isaac Greave's Hedge Shears, James Bees & Parkin's Spoke Shaves, Turn Screws and Braces, Pad Locks, Goulcher's Gun Locks, Brades Trowels, &c.

HERMANN BOKER & CO.,

OFFICES AND WAREHOUSES:

NEW YORK, 101 and 103 Duane and 91 and 93 Thomas Streets.

REMSCHEID and SOLINGEN (Prussia). H. BOKER & CO.

SHEFFIELD (England), No. 3 Arundal Lane, Represented by Mr. ARTHUR LEE.

LIEGE (Belgium), Represented by Mr. LOUIS MULLER.

Manufacturers and Importers of Cutlery, Guns, Hardware and Railroad Material. Proprietors of TRENTON VISE AND TOOL WORKS, Trenton, N. J.—Vises, Picks, Mattocks, Grub Hoes, Sledges, Hammers, Bridge Work, Turn Tables, etc.

Proprietors of the MANHATTAN CUTLERY CO., "O. K." Razors.

Sole Agents for LAMSON & GOODNOW MFG. CO., Shelburne Falls, Mass.—Table Cutlery and Butcher Knives.

W. & S. Butcher's Files, Edge Tools and Razors, the largest stock in the United States. Geo. Wostenholm & Son's Knives, Scissors and Razors, the largest stock in the U. S. John Wilson's Butcher and Shoe Knives. Peter Wright's and Armitage Anvils.

We always have on hand a full assortment of German and English Hardware, Cutlery, Guns, Gun Material, Chains, Heavy Goods.

JOHN WILSON'S CELEBRATED

BUTCHERS' KNIVES,
BUTCHERS' STEELS,
AND
SHOE KNIVES.

THE TRADE MARK, IN ADDITION
TO THE NAME,
IS STAMPED UPON EVERY ARTICLE MANUFACTURED BY
JOHN WILSON.

BUYERS ARE SPECIALLY CAUTIONED AGAINST
IMITATIONS OF THE MARK, AND THE
SUBSTITUTION OF COUNTERFEITS
BEARING THE NAME, "WILSON," ONLY.

GRANTED A.D. 1766, BY THE
CORPORATION OF CUTLERS OF SHEFFIELD,
AND PROTECTED BY ACT OF PARLIAMENT.

Works—SYCAMORE STREET, SHEFFIELD. ESTABLISHED in the Year 1750.

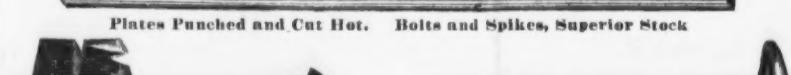
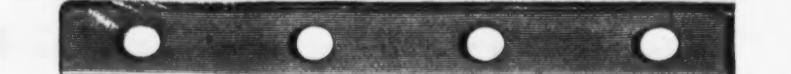
BEAM & MURRAY,

IMPORTERS OF

Anvils, Chains, Pocket Cutlery,
Guns, Files,
BIRMINGHAM, SHEFFIELD & GERMAN HARDWARE,
Wostenholm's IXL Pocket Knives & Razors, Butcher's Files, Tools, &c.
No. 54 Cliff Street, NEW YORK.

Hardware.**PRATT & CO.,**
BUFFALO IRON and NAIL WORKS, Buffalo, N. Y.
Branch Office, 55 Chambers Street, New York.

Manufacture Bar, Angle, and Plate Iron, Spikes and Nails, Railroad Fish Plates, Bolt and Spikes, Railroad and Contractors' Supplies. In general, Bolt Blanks, Coach Screws "Adams Nut Lock."



All sizes constantly on hand. We use the best Lake Superior Iron, and make a uniform handsome nut. Orders solicited. We make washers a specialty. Also

Wholesale Dealers in and Manufacturers of every description of

HEAVY AND SHELF**HARDWARE.**
PRATT & CO., Buffalo, N. Y.**GEORGE B. WALBRIDGE,**

Manufacturers' Agent,

55 Chambers St., New York, Represents:

National Horse Nail Company,
POLISHED AND POINTED NAILS.

SHELTON CO.,
BED SCREWS,
CARRIAGE BOLTS,
TACKS, &c.

Ten Eyck Mig. Co.,
SLEDGES,
GRUB HOES,
HATCHETS, &c.

ALWAYS COOL
STOVE LID LIFTERS,
Ventilated Handles.

Shoenberger's
HAMMERED HORSE SHOES.

WOOLWORTH
HANDLE WORKS,
Axe, Pick and Sledge HANDLES.

Woods Cutlery Co.,
Hot Water Proof TABLE CUTLERY.

National
STOVE POLISH Company.

PRATT & CO.,
BUFFALO HORSE NAILS,
NUTS, WASHERS,
CROW BARS, &c.

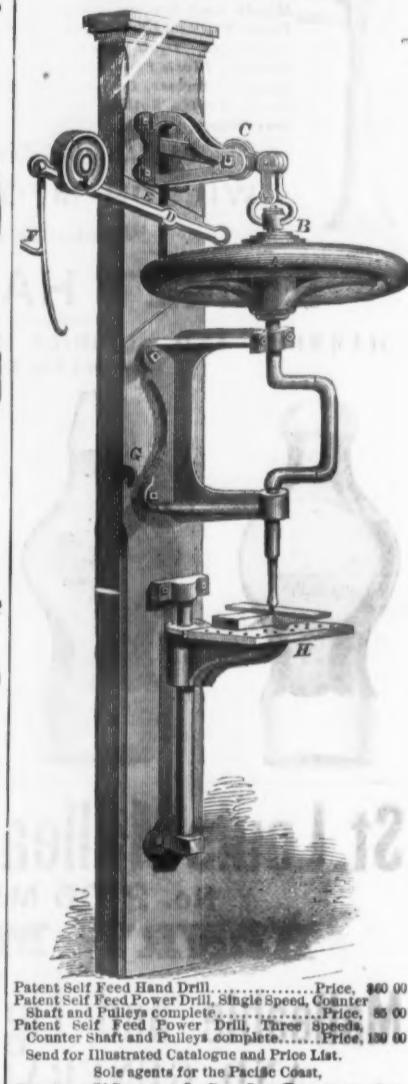
D. H. GOODELL,
Lightning & Turn Table
APPLE PARERS.

ELEPHANT AXES,
HATCHETS,
EDGE TOOLS.

CHALLENGE AUGERS and BITS,
Croton Falls Manuf'g Co.

Hardware.

BIDDLE MFG. CO.,
102 Chambers Street, N. Y.,
Fine Tools & Hardware Specialties
IMPROVED DRILL PRESSES,
SHEARS & PUNCHES.



Patent Self Feed Hand Drill.....Price, \$60.00
Patent Self Feed Power Drill, Single Speed, Counter Shaft and Pulleys complete.....Price, \$55.00
Patent Self Feed Power Drill, Three Speeds, Counter Shaft and Pulleys complete.....Price, \$50.00
Send for Illustrated Catalogue and Price List.
Sole agents for the Pacific Coast,
Conroy, O'Connor & Co., SAN FRANCISCO, CAL.

THE
Peck, Stow & Wilcox Co.,
MANUFACTURERS OF

TINNERS'
Tools and Machines,
AND

GENERAL HARDWARE

97 Chambers Street, New York.



H. CARTER & SON,
290 PEARL ST., NEW YORK.



Manufacturers of and Dealers in all descriptions of
Masons' and Plasterers' Tools,
CARTER'S PATENT CARriage LIFTING JACK, &c.

Ludlow Valve Mfg. Co.,

OFFICE AND WORKS:

938 to 954 River St. & 67 to 83 Vail Ave., Troy, N. Y.

MAKE

VALVES(Double and Single Gate, $\frac{1}{4}$ in. to $\frac{1}{2}$ in.—outside and inside Screws, Indicator, &c.)

for Gas, Water and Steam.

Send for Circular.



Price: Japanned No. 6, \$5; Coppered No. 6, \$6; Silvered No. 6, \$8.

Liberal discount to the trade. All springs warranted to be of the best Steel Wire.

Depots: HYATT & SPENCER, 54 Beekman St., N. Y. SIDNEY SHEPARD & CO., 65 Main St., Buffalo, N. Y. PALMER & GRAY, 225 Elm St., Cincinnati, Ohio. Factory, Indianapolis, Ind.

New York Wholesale Prices, September 3, 1873.

HARDWARE.

Sold Cast Steel.	\$1 lb 14
Wright's.	lb gold 12¢; over 200 lbs 12¢; gold
Armitage's Mouse Mole.	lb gold 12¢
Willis Avail Co.	lb gold 11¢
Eagle Avail Co.	lb gold 12¢
Apple Parers.	dis 15 @ 15¢
Turn Table.	dis 15 @ 15¢
Lightning.	dis 15 @ 15¢
Reading.	dis 15 @ 15¢
Union.	dis 15 @ 15¢
Bay State, Parting, Coring and Seeling.	dis 15 @ 15¢
Climax Slicer.	dis 15 @ 15¢
Bay State Peach Parer.	dis 15 @ 15¢
Lightning.	dis 15 @ 15¢
Pearl and Hair.	dis 15 @ 15¢
Augers and Bits.	dis 15 @ 15¢
Snell Mfg. Co.	dis 15 @ 15¢
Douglas Mfg. Co., No. 1.	dis 15 @ 15¢
" Hollow Augers.	dis 15 @ 15¢
Cushman's Expanding Hollow Augers.	dis 15 @ 15¢
Ives.	dis 15 @ 15¢
Hollow Augers.	dis 15 @ 15¢
Angled Augers.	dis 15 @ 15¢
Andrews' Bits.	dis 15 @ 15¢
Cook's Patent Augers.	dis 15 @ 15¢
Sheridan's Double Cut Bits.	dis 15 @ 15¢
Griswold's Patent.	dis 15 @ 15¢
Cast Steel Bits.	dis 15 @ 15¢
Auger Bits.	dis 15 @ 15¢
Long Augers.	new list dis 15 @ 15¢
Bonney's Patent Hollow.	dis 15 @ 15¢
Stein's Bit Stock Drills.	dis 15 @ 15¢
Axes.	dis 15 @ 15¢
Blood's.	dis 15 @ 15¢
Hunt's.	dis 15 @ 15¢
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Hurd's.	dis 15 @ 15¢
Schweitzer Mfg. Co.'s.	dis 15 @ 15¢
Ashley's.	dis 15 @ 15¢
Simmons'.	dis 15 @ 15¢
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Pratt's Aerating.	dis 15 @ 15¢
Dover.	dis 15 @ 15¢
Emery.	dis 15 @ 15¢
Genuine Chester.	dis 15 @ 15¢
Fair and FF.	dis 15 @ 15¢
Washington Mills—Regular Note.	dis 15 @ 15¢
Flour.	dis 15 @ 15¢
Embossed and Tinned Ware.	dis 15 @ 15¢
Kettles.	dis 15 @ 15¢
Sauce Pans, Glue Pots, &c.	dis 15 @ 15¢
Faucets.	dis 15 @ 15¢
Corn Lined, Wood.	dis 15 @ 15¢
Fenn's.	dis 15 @ 15¢
Cork Stop.	dis 15 @ 15¢
Star.	dis 15 @ 15¢
Frary's Patent Petroleum.	dis 15 @ 15¢
White Metal.	dis 15 @ 15¢
Globe.	dis 15 @ 15¢
Hand.	dis 15 @ 15¢
Abbe's.	dis 15 @ 15¢
Taylor's Patent Door.	dis 15 @ 15¢
Western Gong.	dis 15 @ 15¢
Brock's Ark.	dis 15 @ 15¢
" Pull.	dis 15 @ 15¢
Hart Mfg. Co., Crank and Pull.	dis 15 @ 15¢
Cow—Common Wrought.	dis 15 @ 15¢
Western.	dis 15 @ 15¢
Kent's.	dis 15 @ 15¢
Dodge's Genuine Kentucky.	dis 15 @ 15¢
Yaw's Genuine.	dis 15 @ 15¢
Bellows.	dis 15 @ 15¢
Brown's.	dis 15 @ 15¢
Moulders'.	dis 15 @ 15¢
Blind Fasteners.	dis 15 @ 15¢
Van Sand's.	dis 15 @ 15¢
Washington's Patent.	dis 15 @ 15¢
Marinier's.	dis 15 @ 15¢
Bind Staples.	dis 15 @ 15¢
Boardman's Patent, $\frac{1}{2}$ in. and larger.	dis 15 @ 15¢
" $\frac{1}{4}$ in.	dis 15 @ 15¢
Boats.	dis 15 @ 15¢
Cast Iron Barrel, Shutter, &c.	old list dis 15 @ 15¢
Wrought Iron Barrel.	old list dis 15 @ 15¢
Carriage and Tire.	old list dis 15 @ 15¢
Carriage and Tire.	old list dis 15 @ 15¢
Norway Iron.	old list dis 15 @ 15¢
Star, Philadelphia.	dis 15 @ 15¢
Eagle, Philadelphia.	dis 15 @ 15¢
Peerless, F. B. & W.	old list dis 15 @ 15¢
Carriage and Tire.	old list dis 15 @ 15¢
Plow, R. B. & W.	old list dis 15 @ 15¢
Stove, R. B. & W.	old list dis 15 @ 15¢
Undercut Co.	old list dis 15 @ 15¢
Machine.	old list dis 15 @ 15¢
Hornax.—For case of 100 lbs.	dis 15 @ 15¢
Boring Machines.	dis 15 @ 15¢
Kellogg's.	dis 15 @ 15¢
Sash Mfg. Co., Rice's Patent.	dis 15 @ 15¢
" Regular.	dis 15 @ 15¢
Douglas Mfg. Co.	dis 15 @ 15¢
Hovey's Angle.	dis 15 @ 15¢
" 15¢ doz \$15 00 22 15 net doz 15¢	
Morticing Machines, each.	dis 15 @ 15¢
Braces.	dis 15 @ 15¢
Braes' Patent.	dis 15 @ 15¢
Brown's.	dis 15 @ 15¢
Spooff's Patent.	dis 15 @ 15¢
Noble's Patent.	dis 15 @ 15¢
Batholomew's American Ball.	dis 15 @ 15¢
Standard Grip.	dis 15 @ 15¢
Q. S. Backen & Co.	dis 15 @ 15¢
Bang Hole Bore.	dis 15 @ 15¢
Common and Ring.	dis 15 @ 15¢
Enterprise Eng. Co.	dis 15 @ 15¢
Invincible Bore.	dis 15 @ 15¢
Batting Cleavers.	dis 15 @ 15¢
Bradley's.	dis 15 @ 15¢
Beatty's.	dis 15 @ 15¢
Beaufort's.	dis 15 @ 15¢
Blind Hammer.	dis 15 @ 15¢
Quakertown.	dis 15 @ 15¢
" Hammer and Hatchet.	dis 15 @ 15¢
Greenabrook's Axe, Pick, Hammer, &c.	dis 15 @ 15¢
Woodworth Axe, Pick and Sledge.	dis 15 @ 15¢
Iron and Wood Wheel Plate.	new list dis 15 @ 15¢
Brass Wheel Plate.	new list dis 15 @ 15¢
Front Wheel Plate.	new list dis 15 @ 15¢
Chain.	dis 15 @ 15¢
English Coll.	dis 15 @ 15¢
French.	dis 15 @ 15¢
Chalk.	dis 15 @ 15¢
Red.	dis 15 @ 15¢
Blue.	dis 15 @ 15¢
Orisons.	dis 15 @ 15¢
Family Sliders.	dis 15 @ 15¢
Chisels.	dis 15 @ 15¢
Socket Firms.	dis 15 @ 15¢
Boxwood.	dis 15 @ 15¢
Socket Copper.	dis 15 @ 15¢
Butcher's.	dis 15 @ 15¢
Newbold's.	dis 15 @ 15¢
Spofford & Jackson's.	dis 15 @ 15¢
Clips, Axle.	dis 15 @ 15¢
Norway or Best.	dis 15 @ 15¢
Superior.	dis 15 @ 15¢
" Superior, Philadelphia.	dis 15 @ 15¢
Coat Shovels.	dis 15 @ 15¢
Iron Handled.	dis 15 @ 15¢
Wooden Handled.	dis 15 @ 15¢
Crates.	dis 15 @ 15¢
No.	dis 15 @ 15¢
Trace, 6¢ 10-12.	dis 15 @ 15¢
Trace, 7-10.	dis 15 @ 15¢
Galvanized Pump Chain.	dis 15 @ 15¢
German Hanger Chain.	dis 15 @ 15¢
Hat and Coat.	dis 15 @ 15¢
Wrought Staples and Hooks and Staples.	dis 15 @ 15¢
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Jack Chain, Iron.	dis 15 @ 15¢
Brass.	dis 15 @ 15¢
Chalk.	dis 15 @ 15¢
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Blue.	dis 15 @ 15¢
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Wooden Handled.	dis 15 @ 15¢
Crates.	dis 15 @ 15¢
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CHARCOAL TIN PLATE.			
I C 10x14	Prime Charcoal.	12.50	
" 12x12	"	14.00	
" 14x20	"	14.25	
" 10x14	"	15.75	
" 12x12	"	16.25	
" 14x20	"	16.75	
For each additional X add		2.25	
COKE TIN PLATE.			
BEST	3d Quality.	Ordinary	
I C 10x14	12.25	12.00	\$50 @ \$11.00
I C 12x12	13.00	12.00	
I C 14x20	16.00	15.75	
TIN PLATE.			
Prime Char.	2d qual.	Coke.	
I C 10x20	\$12.25	11.75 @ 11.75	
ZINC: DUTY: Pig Block, \$1.50 per 100 lbs. Sheet, 25c. P. B. All subject to deduction of 10 per cent. Sheet.....		each 10c	
		open 10c	

Paper Stock, Old Metals, &c.

(Dealers' Selling Prices.)

COTTON LINEN	6 @ 6c
" COTTON, NO. 1	7.5 @ 7c
" NO. 2	4
WHITE LINEN RAGS, NO. 1	7 @ 7c
" NO. 2	4.5 @ 5c
COLORED	8 @ 8c
MIXED WOOLENS	3 @ 3c
SOFT WOOLENS	6.5 @ 7c
GUNNY BAGGING	1.5 @ 1.5c
JUTE BAGGINGS	1.5 @ 1.5c
KENTUCKY BAGGING	1.5 @ 1.5c
BOOK STOCK	1.5 @ 1.5c
WASTE PAPER AND SCRAPS	2.5 @ 2.5c
HOPES CUTTINGS	1.5 @ 1.5c
KENTUCKY BAGGING	1.5 @ 1.5c
OAKUM, CANK, NO. 1	5.5 @ 5.5c
" NO. 2	4.5 @ 4.5c
GRASS ROPE	4.5 @ 4.5c
TARRED SHAKING	1.5 @ 1.5c
OLD METALS.	
COPPER	.26 @ .27
YELLOW METAL	.19
BRASS	.20
HORN BRASS	.21
OLD LEAD, SOLID	.04 @ .07
TEA LEAD	.04 @ .07
WRUGHT IRON	1.5 @ 2
IRON	1
CAST IRON	1 @ 1.5c
MACHINERY IRON	1.5 @ 2
ZINC	.5 @ .5c
FEWTER, NO. 1	.26 @ .27
" NO. 2	.10 @ .12
SPELTER	.7

Paints, Oils, etc.

PAINTS.			
BLACK, LAMP—COACH PAINTERS	20c		
" ORDINARY	4c		
" IVORY DROPS, FAIR	1.5c		
" " BEST	.5c		
BLACK PAINT, IN OIL	1.5c		
BLUE, PRUSSIAN, FAIR TO BEST	1.5c		
" " IN OIL	.5c		
" CHINESE, DRY	.5c		
" ULTRAMARINE	.5c		
BROWN, SPANISH	.5c		
" VAN DYKE	.5c		
CARMINE, 40.	12.00		
GREEN, CHROME	1.5 @ 2c		
" PARTS	good, 50c; best, 60c		
" " IN OIL	.5c		
MINERAL PAINTS	.10 @ .15c		
ORANGE MINERAL	.10 @ .15c		
RED LEAD	.10 @ .15c		
" ENGLISH	.10 @ .15c		
" VENETIAN (N. C.) DRY	.25c		
" IN OIL	.5c		
" INDIAN, DRY	.10 @ .15c		
EPOX PINK	.10 @ .15c		
BRITANNIA, AMERICAN, RAW	.4c		
" BURNT	.4c		
" RAW	.15 @ .25c		
UMBER, BURNT	.4c		
" RAW	.15 @ .25c		
VERMILLION, CHINESE	.15 @ .25c		
" ENGLISH	.15 @ .25c		
WHITE LEAD, AMERICAN, PURE DRY	.11 @ .15c		
WHITE LEAD, AMERICAN, IN OIL	.11 @ .15c		
WHITE, PARIS, ENGLISH, PRIME	in bbls. 2.5 @ 3c		
YELLOW OCHRE, FRENCH, PRIME	in bbls. 2.5 @ 3c		
" " IN OIL	1.5c		
" " ASST'D CANS, 1L; KEGS, 50c			
Vermont	.10 @ .15c		
CHROME	.17 @ .25c		
" IN OIL	.10 @ .15c		
ZINN, WHITE, AMERICAN NO. 1	.10 @ .15c		
" " FRENCH (PARIS)	.11 @ .15c		
" " IN OIL	.12 @ .15c		
OILS.			
LINSEED RAW	2 gal. casks, 90c; bbls. 94c		
" BOILED	90c		
WHALE, 100%	1.5c		
SEAL, REDUCED WINTER	1.5c		
Sperm, Crude	1.5c		
" WINTER UNBLEACHED	1.5c		
SEA, EXTRA REDUCED	1.5c		
LARD, PURE WINTER	1.5c		
" SPRING	1.5c		
COTTON SEED, CRUDE	1.5c		
" SOUTHERN YEAST	1.5c		
" WHITE	.75c		
NEATSFOOT, WINTER	1.5 @ 1.5c		
NATURAL LUBRICATING	bbls, 45c		
SUNDRIES.			
ASPHALTUM	.5c		
BEZELINE	.5c		
CHALK	.10 @ .15c		
" BLOCK	.5c		
DRYER, PATENT, AMERICAN	ASST'D CANS, 1.5c; KEGS, 50c		
" ENGLISH	1.5c		
FLOCKS	.5c		
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" SHEET	.50c		
GLAZED POTTS, ZINC	.5c		
GUM, COCONUT	.5c		
" DAMAR	.5c		
" SHELLAC, ENGLISH, DARK	.5c		
LIMONITE	.10c		
PUFFICE STONE, SELECTED LAMPS	.4 @ .5c		
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ROTTON STONE, SOFT, ENGLISH	.8c		
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French Window—1st, 2d, 3d, and 4th qualities. Per box of 50 feet.			
SINGLE.			
SIZES.			
1	II	III	IV.
6 x 8 to 10 x 15	16.00	14.00	13.50
11 x 14 & 12 x 13	11.25	10.25	9.75
10 x 16 to 14 x 26	12.50	11.50	10.75
18 x 22	13.75	12.00	10.75
15 x 30 to 20 x 30	14.00	13.00	12.50
22 x 30 to 26 x 34	15.75	14.00	13.00
26 x 36 to 30 x 36	18.75	16.50	15.50
26 x 36 to 30 x 44	20.25	17.50	16.00
28 x 44 to 30 x 50	24.00	21.00	18.75
30 x 44 to 34 x 50	26.00	23.00	20.50
30 x 56 to 34 x 56	29.50	26.25	22.00
34 x 58 to 34 x 60	31.50	29.50	25.00
36 x 60 to 40 x 60	37.00	32.50	29.50
DOUBLE.			
SIZES.			
1	II	III	IV.
6 x 8 to 10 x 15	\$16.00	\$14.00	\$13.50
11 x 14 & 12 x 13	11.25	10.50	10.25
10 x 16 to 14 x 26	12.50	11.50	10.75
18 x 22	13.75	12.50	11.50
15 x 30 to 20 x 30	14.00	13.00	12.50
22 x 30 to 26 x 34	15.75	14.00	13.00
26 x 36 to 30 x 44	18.75	16.50	15.50
30 x 44 to 34 x 50	24.00	21.00	18.75
30 x 56 to 34 x 56	26.00	23.00	20.50
34 x 58 to 34 x 60	29.50	26.25	22.00
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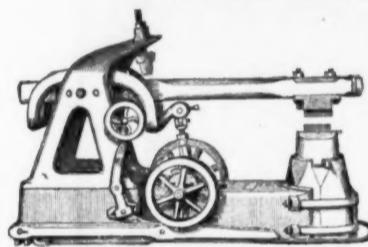
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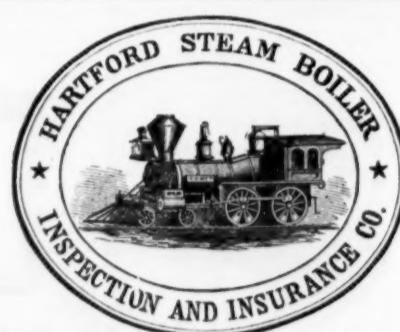
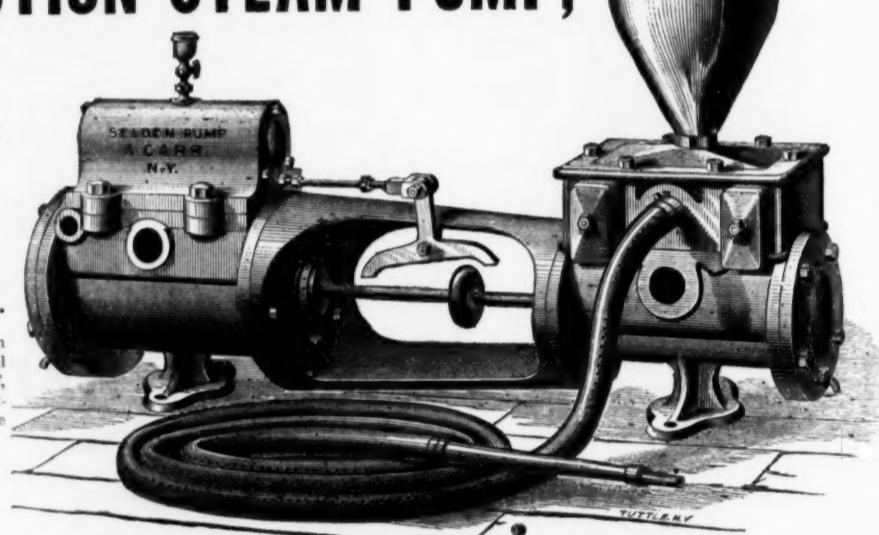
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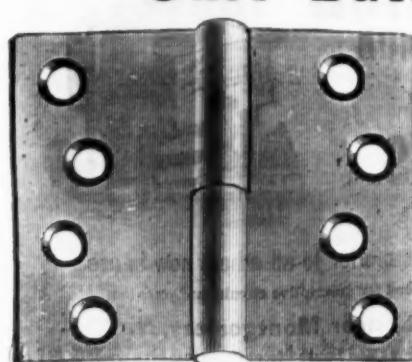
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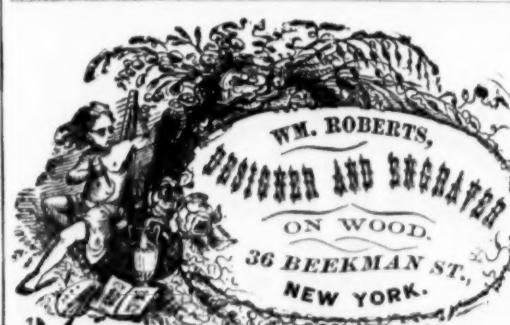
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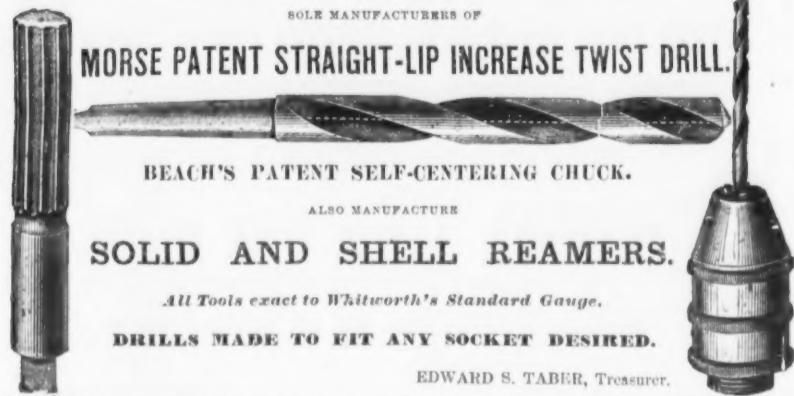
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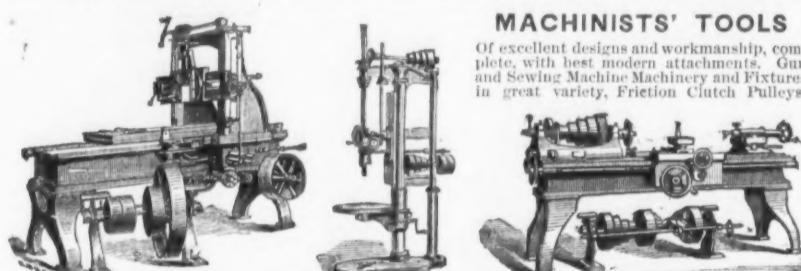
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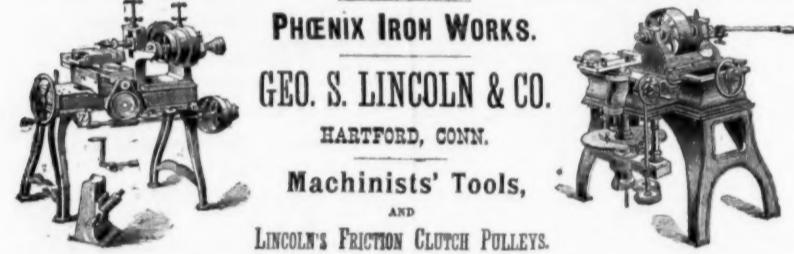
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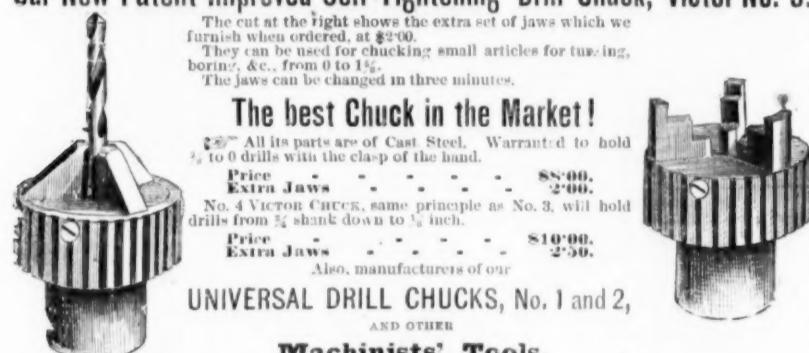
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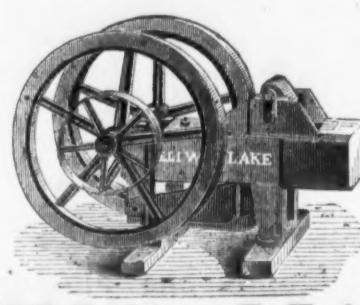
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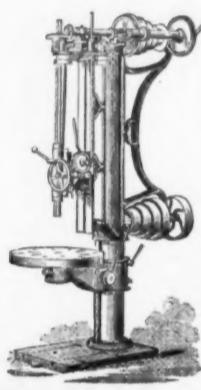
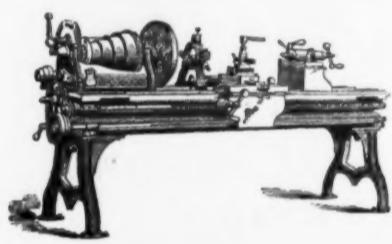
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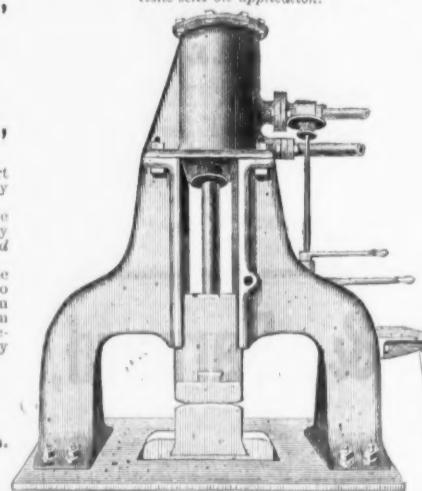
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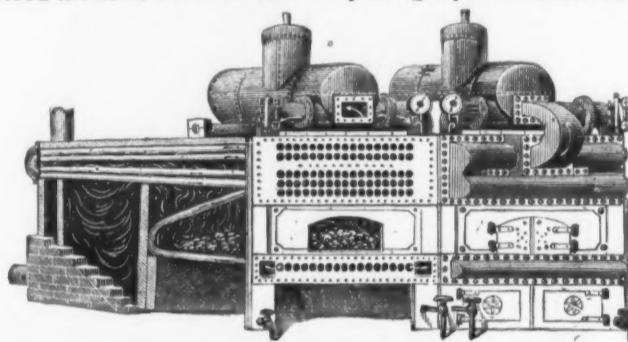
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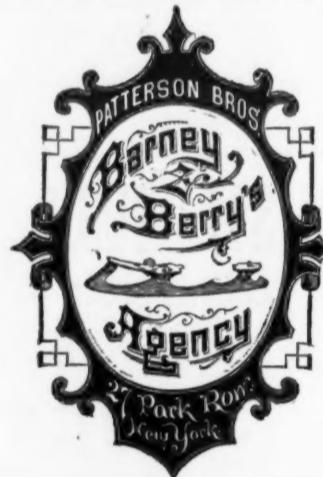
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